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HELMINTHS OF SMALL MAMMALS (ERINACEOMORPHA, SORICOMORPHA, CHIROPTERA, RODENTIA, AND LAGOMORPHA) OF MONGOLIA



DAVID S. TINNIN, SUMIYA GANZORIG, AND SCOTT L. GARDNER

Front cover: Left: Metacestodes of the genus *Taenia* from the body cavity of *Meriones meridianus*, NK166316, MSB199748, from Mongolia, Gobi Gurvan Saikhan National Park; Khongorin Els; Saxaul Forest; 24 July 2009. Top right: Long-eared hedgehog, *Hemiechinus auritus*, in the Gobi Gurvan Saikhan National Park. Bottom right: Typical Mongolian “Ger” in the countryside near Ikh Bogd Mountain, Mongolia. Photographs by team members of the Mongolian Vertebrate Parasite Project.

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Helminths of Small Mammals (Erinaceomorpha, Soricomorpha, Chiroptera, Rodentia, and Lagomorpha)
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HELMINTHS OF SMALL MAMMALS (ERINACEOMORPHA, SORICIMORPHA, CHIROPTERA, RODENTIA, AND LAGOMORPHA) OF MONGOLIA

DAVID S. TINNIN, SUMIYA GANZORIG, AND SCOTT L. GARDNER

ABSTRACT

Ninety-eight species of small mammal, excluding carnivores and ungulates, are currently recognized in the fauna of Mongolia. A list of species of helminths known to infect these species, both within Mongolia and across their range, is presented in an effort to aid in their study. A detailed bibliography of pertinent survey and related publications is provided.

Key words: Acanthocephala, bat, cestode, helminth, insectivore, lagomorphs, mammal, Mongolia, nematode, rodent, trematode

INTRODUCTION

Within the fauna of Mongolia there are currently 98 recognized species of small mammals (Erinaceomorpha, Soricimorpha, Chiroptera, Rodentia, and Lagomorpha). None of these species are endemic to the country, and their known geographic ranges are highly variable, ranging from narrow distributions along the borders of Mongolia and neighboring regions of northern China or Transbaikalia Russia, to Holarctic. Most however, as currently recognized, are moderately distributed across Central Asia (Bannikov 1954; Sokolov and Orlov 1980; Tinnin et al. 2002; Clark et al. 2006).

Much of the literature concerning these species and their helminths is found in disparate, and sometimes questionable, sources from across Eurasia. Few current papers have been published on the parasite biodiversity of the region so, in an effort to aid in the study of the biodiversity of parasites of small mammals of the Mongolian and Central Asian region, we reviewed the literature to provide a list of known parasites from those species. As can be expected, species with the widest distributions, particularly those that occur through Asia and into Europe, are those that have been studied the most. Those species with more limited distributions, particularly those restricted to Central Asia or narrower ranges, are the least studied, or often, these species have never had parasites reported from them and are totally unknown.

Of these 98 species of small mammals known from Mongolia, 63 currently have no known parasites within the country. Of the 35 mammal species from which helminths are known, only 6 currently are known to be hosts for more than two species of parasite. From these host species there are 31 species of helminths known within the country. Across their entire Eurasian ranges, 31 of these mammals have no record of being hosts for parasites. Twelve of those studied across their ranges are currently only known to host a single species of helminth. Currently there is a total of 384 species of helminths known to infect these small mammals across Eurasia outside of Mongolia.

Data for the list was compiled from examination of a total of 449 publications. Due to the evolving nature of our understanding of species limits within helminths, a concerted effort to resolve all synonymies among species reported, over the course of the last century, was not undertaken. As it is easier to resolve the ultimate identity of a species from its most restrictive identification rather than its recent, or past, broader synonymization, it was deemed wiser to list them as identified. However, some effort was exerted to make the species reported, in terms of generic membership, consistent as far as recent taxonomy is concerned.

Hopefully, this list can serve to emphasize what is known, parasitologically, from the region, and as a starting point to further our understanding of host/

parasite relationships and the natural history of species from the region.

SPECIES ACCOUNTS

ERINACEOMORPHA

Erinaceidae

Hemiechinus auritus (Gmelin 1770)

Long-eared Hedgehog

Distribution.—*Hemiechinus auritus* is found across northern Eurasia from eastern Ukraine to Mongolia, and in the southern part of its range from Libya to western Pakistan. In Mongolia, it is found across the desert and semi-desert areas of the northwestern and southern parts of the country.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811). Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811), *Nephridiorhynchus major* (Bremser 1811); CESTODA - *Mathevotaenia skrjabini* Spassky 1949, *Mesocetoides lineatus* (Goeze 1782); NEMATODA - *Physaloptera anadonta* Shal'dybin 1960, *Physaloptera dispar* Linstow 1904, *Physaloptera erinacei* Tokobaev and Erkulov 1970, *Rictularia shal'dybini* Skrjabin, Sobolev, and Ivashkin 1967, *Rictularia* sp., *Skrjabinus* sp., *Sobolevispirura arali* Shal'dybin 1960, *Spirura rytipleurites seurati* (Deslongchamps 1824), *Trichinella nativa* Britov and Boev 1972.

Comments.—Boev et al. (1975) confirmed identification of *T. nativa* in Kazakhstan, not *T. spiralis* as previously reported by Boev et al. 1966.

Literature.—Spassky 1949; Shal'dybin 1960; Kurashvili 1967; Skrjabin, Sobolev, and Ivashkin 1967b; Gafurov 1970; Barus, Kullmann, and Tenora 1970; Davlatov 1974; Tokobaev 1976; Boev et al. 1966, 1975; Erkulov and Moldopiyazova 1986; Tinnin et al. 2002, 2008.

Mesechinus dauuricus (Sundevall 1842)

Daurian Hedgehog

Distribution.—The Daurian hedgehog ranges from central China across Mongolia into the Amur region of Siberia. In Mongolia they are found in the northeast part of the country in steppe and forest-steppe habitats.

Parasites.—In Mongolia: *Moniliformis moniliformis* (Bremser 1811). Across range: *Macracanthorhynchus catulinus* Kostylew 1927.

Literature.—Barus, Kullmann, and Tenora 1970; Tinnin et al. 2002; Hutterer 2005a; Tinnin et al. 2008.

SORICOMORPHA

Soricidae

Crocidura sibirica Dukelsky 1930

Siberian Shrew

Distribution.—The Siberian shrew ranges across southern Siberia, Mongolia, and China. In Mongolia they are known from the Mongolian Altai, Khangay Mountains, and from scattered localities in the eastern Gobi and southern desert near water sources.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Hepatocestus hepaticus* (Baer 1932).

Comments.—In northern regions, these shrews are known to occasionally inhabit mole tunnel systems.

Literature.—Karpenko 1996; Tinnin et al. 2002; Hutterer 2005b; Batsaikhan et al. 2010.

Neomys fodiens (Pennant 1771)

Eurasian Water Shrew

Distribution.—Water shrews are found across Eurasia from Great Britain to Korea and Sakhalin Island. In Mongolia they are found in the northern mountains and Great Lakes regions.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Polymorphus minutus* (Goeze 1782); CESTODA - *Choanotaenia estavarensis* Euzet and Jourdan 1968, *Choanotaenia filamentosa* (Goeze 1782), *Coronacanthus integra* (Hammann 1891), *Coronacanthus magnihamatus* Vasileva et al. 2005, *Coronacanthus omissa* (Baer and Joyeux 1943), *Coronacanthus vassilevi* Genov 1980, *Cryptocotylepis globosoides* (Soltys 1953), *Ditestolepis diaphana* (Cholodkowsky 1906), *Hepatocestus hepatica* (Baer 1932), *Hymenolepis alpestris* Baer 1931, *Hymenolepis anacetabulata* Soltys 1953, *Hymenolepis fodientis* Vaucher 1971, *Hymenolepis globosa* Baer 1931, *Hymenolepis magnirostellata* Baer 1931, *Hymenolepis polyacantha* Baer 1931, *Hymenolepis neomidis* Baer 1931, *Hymenolepis tridontophora* Soltys 1953, *Insectivorolepis infirma* Zarnowski 1955, *Lineolepis scutigera* (Dujardin 1845), *Metorchis revilliodi* Baer 1931, *Neoskrjabinolepis shaldybinii* Spassky 1947, *Pseudobothriolepis mathevossianae* Shaldybin 1957, *Soricinia soricis* (Baer 1927), *Simuterilepis diglobovari* Sadovskaya 1965, *Staphylocystis bacillaris* (Goeze 1782), *Staphylocystis jacobsoni* Linstow 1907, *Staphylocystis loossi* (Hilmy 1936), *Staphylocystis pistillum* (Dujardin 1845), *Staphylocystis tiara* (Dujardin 1845), *Taenia leuckarti* Krabbe 1869, *Triodontolepis boyanensi* Vasileva et al. 2005, *Triodontolepis bifurca* (Hammann 1891), *Triodontolepis hamanni* (Mrazek 1891), *Triodontolepis kurashvilii* Prokopi and Matsaberidze 1971, *Triodontolepis skrjabini* Spassky and Andreiko 1968, *Triodontolepis torrentis* Murai 1987, *Vampirolepis heleni* Shaldybin 1964, *Vigisolepis barbascolex* Spassky 1949, *Vigisolepis spinulosa* (Cholodkowsky 1906); NEMATODA - *Capillaria oesophagica* Soltys 1952, *Capillaria incrassata* (Diesling 1851), *Capillaria konstantini* Romashov 1999, *Crenosoma skrjabini* Pologentsev 1935, *Eucoleus bernardi* Romashov 1983, *Longistriata neomi* Lyubarskaya 1962, *Physaloptera soricina* (Baylis 1934), *Porrocaecum depressum* larval (Zeder 1800), *Syphacia obvelata* (Rudolphi 1802),

Thominx blarinae (Ogren 1953), *Trichinella spiralis* (Owen 1835), *Trichuris* (= *Trichocephalus*) *neomi* Lyubarskaya 1962; TREMATODA - *Brachylaemus oesophagei* Shaldybin 1953, *Brachylaemus spinulosus* (Hoffmann 1899), *Cephalotrema elastica* Bregenzner 1916, *Cephalotrema minutus* Baer 1944, *Ectosiphonus* sp., *Euryhalmis squamula* (Rudolphi 1819), *Leucochloridium skrjabini* Shaldybin 1953, *Maritrema carpathica* Matkasi 1984, *Maritrema pyrenaica* Deblock & Combes 1965, *Metorchis albidus* (Braun 1893), *Microphallus gracilis* Baer 1944, *Nephrotrema truncatum* (Leuckart 1842), *Opisthioglyphe locellus* (Kossack 1900), *Opisthioglyphe megastomus* Baer 1944, *Opisthioglyphe oschmarini* Shaldybin 1953, *Panopisthus pricei* Sinitin 1931, *Parabascus combesi* Jourdan 1973, *Pseudocephalotrema pyrenaica* Combes and Jourdan 1969, *Opisthioglyphe exasperatum* (Rudolphi 1819), *Plagiorchis neomidis* Brendow 1970, *Plagiorchis obtusus* Strom 1940, *Plagiorchis opisthovitellinus* Soltys 1953, *Pseudoleucochloridium soricis* Soltys 1952, *Psilotornus confertus* Machalska 1974, *Skrjabinophyetus neomydis* Dimitrova and Genov 1967.

Comments.—In Germany, Brendow (1970) found the sporocysts of *Plagiorchis neomidis* in the snail *Radix peregra* and the metacercaria in caddis-flies; while the snail *Bythinella compressa* and amphipod *Gammarus pulex* were hosts to the larvae of *Cephalotrema elastica*. Combes et al. (1974) determined that in France, *Bythinella reyniesii* is the first and *Rana temporaria* the second intermediate host of *Euryhalmis squamula*. Jourdan (1972) found that in France, the slug *Arion lusitanicus* is an intermediate host for the cestode *Choanotaenia estavarensis*. Jourdan (1977 1979) found that in the Pyrenees *Microphallus gracilis* and *Maritrema pyrenaica* use the mollusc *Bythinella reyniesii* as the first intermediate host, and the second intermediate host is *Gammarus pulex*. According to Mas-Coma (1978), the presence of *Psilotornus confertus* and *Pseudoleucochloridium soricis* likely represent accidental infections as the normal hosts for these trematodes are birds, such as members of the genus *Turdus*. Muari (1987) indicates that *Gammarus* spp. are the likely intermediate hosts for the cestode *Triodontolepis torrentis*. Theron (1976) reports that the first and second intermediate hosts, respectively, of *Plagiorchis neomidis* in the Pyrenees are *Radix limosa* and the alder fly *Sialis lutaria*.

Literature.—Baer 1931; Baer 1932; Baer 1944; Dollfus and Callot 1945; Karpinski and Kaminska 1948; Soltys 1952; Ogren 1953; Shaldybin 1953; Soltys 1953; Morozov 1960; Spassky 1960; Zarnowski 1960; Bernard 1961; Lyubarskaya 1962; Shaldybin 1964; Mituch 1964b; Sadovskaya 1965; Chirac and Hamar 1966; Dimitrova and Genov 1967; Euzet and Jourdan 1968; Spassky and Andreiko 1968; Combes and Jourdan 1969; Euzet and Jourdan 1970; Jourdan 1971; Prokopic and Matsaberidze 1971; Vaucher 1971; Jourdan 1972; Prokopic and Matsaberidze 1972; Jourdan 1973; Combes et al. 1974; Machalska 1974; Eltyshev 1975; Combes et al. 1976; Theron 1976; Jourdan 1977; Mas-Coma 1977; Mas-Coma 1978; Jourdan 1979; Genov 1980; Yanchev and Stoikova-Khadzhinikolova 1980; Romashov 1983; Genov and Khadzhinikolova 1984; Matkasi 1984; Matsaberidze et al. 1986; Murai 1987; Tkach 1991; Karpenko 1996; Gulyaev and Kornienko 1999; Romashov 1999; Tinnin et al. 2002; Ribas et al. 2005; Hutterer 2005b; Vasileva et al. 2005.

***Sorex caecutiens* (Laxmann 1788)**

Laxmann's Shrew

Distribution.—Laxmann's shrew ranges from eastern Europe across to eastern Siberia, south into Ukraine, northern Kazakhstan across the Altai Mountains into Mongolia, northeast China and across into Korea, as well as Sakhalin Island. In Mongolia, they are restricted to regions of the Khentey and Khangay Mountains.

Parasites.—In Mongolia: NEMATA - *Soboliphyme ataahai* Ganzorig et al. 2003. Across range: CESTODA - *Cucurbilepis trifolia* Karpenko 1983, *Ditestolepis diaphana* (Cholodkovsky 1906), *Ditestolepis quarta* Karpenko 1983, *Ecrinolepis mirabilis* Spassky and Karpenko 1983, *Ecrinolepis orientales* Melnikova et al. 2005, *Lineolepis borealis* Karpenko and Shakhmatova 1985, *Lineolepis scutigera* (Dujardin 1845), *Lineolepis spasskii* Karpenko 1984, *Mathevolepis larbi* Karpenko 1982, *Neoskrjabinolepis schaldybini* Spassky 1947, *Pseudodiorchis prolifer* (Villot 1890), *Simuterilepis diglobovari* Sadovskaya 1965, *Soricinia aporalis* Karpenko 1984, *Soricinia bargusinica* Eltyshev 1975, *Soricinia cirravaginata* Eltyshev 1975, *Soricinia collaris* Karpenko 1984, *Soricinia macrospina* Karpenko 1984, *Soricinia soricis* (Baer 1927), *Spasskylepis pheodorovi* Karpenko 1984,

Staphylocystis sibirica (Morozov 1957), *Vigisolepis amurensis* Karpenko 1984, *Zarnowskiella stefanskii* (Zarnowski 1954); NEMATA - *Capillaria capillaria* (Linstow 1882), *Capillaria hepatica* (Bancroft 1893), *Capillaria kutori* Ruchladeva 1946, *Capillaria oschmarini* Nadtochy and Rassakazova 1971, *Capillaria sp.*, *Longistriata ljamkini* Eltyshev 1975, *Longistriata yamashitai* Chabaud et al. 1963, *Paracrenosoma skrjabini* (Pologentev 1935), *Physaloptera soricina* Baylis 1934, *Soboliphyme baturini* larval Petrow 1930, *Stefanskostrongylus mascomai* Kontrimavichus & Delyamure 1979; TREMATODA - *Alaria alata* (Goeze 1782), *Corrigia sobolevi* Nadtochy 1965, *Opisthioglyphe sobolevi* Shaldybin 1953, *Plagiorchis eutamias* Schulz 1932, *Sorexeglyphe kamtschatica* Nadtochy 1965.

Literature.—Morozov 1957; Chabaud et al. 1963; Nadtochy 1965; Sadovskaya 1965; Nadtochy and Rassakazova 1971; Eltyshev 1975; Kontrimavichus & Delyamure 1979; Domnich 1982; Karpenko 1982; Karpenko 1983; Spassky and Karpenko 1983; Domnich 1984; Karpenko 1984a; Karpenko 1984b; Karpenko 1984c; Karpenko and Shakhmatova 1985; Karpenko 1989; Karpenko and Chechulin 1990; Afanaseva 1993; Iwaki et al. 1993; Tinnin et al. 2002; Ganzorig et al. 2003; Melnikova et al. 2005; Tinnin et al. 2008.

***Sorex daphaenodon* Thomas 1907**

Large-toothed Siberian Shrew

Distribution.—This shrew is found from the Urals Mountains in Russia across Asia, into Afghanistan to Korea and Sakhalin Island. In Mongolia it is known from the northern Khangay Mountains, east to the border through the Khentey Mountains and northern steppe regions.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Ditestolepis quarta* Karpenko 1983, *Ecrinolepis mirabilis* Spassky and Karpenko 1983, *Mathevolepis larbi* Karpenko 1982, *Mathevolepis triovaria* Karpenko 1990, *Neoskrjabinolepis schaldybini* Spassky 1947, *Soricinia aporalis* Karpenko 1984, *Soricinia collaris* Karpenko 1984, *Soricinia macrospina* Karpenko 1984, *Spasskylepis pheodorovi* Karpenko 1984, *Zarnowskiella stefanskii* (Zarnowski 1954); NEMATA - *Soboliphyme baturini* larval Petrow 1930.

Comments.—Karpenko (1985) reported on the use of *S. daphaenodon*, in which he found encapsulated larvae, as a paratenic host for *Soboliphyme baturini*. The intermediate hosts of this nematode, whose definitive hosts are mustelids, are oligochates in the family Enchytraeidae.

Literature.—Karpenko 1982; Karpenko 1983; Spassky and Karpenko 1983; Karpenko 1984a; Karpenko 1984c; Karpenko 1985; Karpenko 1989; Karpenko 1990; Karpenko and Chechulin 1990; Tinnin et al. 2002; Ganzorig et al. 2003; Hutterer 2005b.

***Sorex isodon* Turov 1924**
Equal-toothed Shrew

Distribution.—The equal-toothed shrew ranges from Scandinavia across Russia to the Pacific, south into Mongolia, China and Korea, as well as onto the islands of Sakhalin and Hokkaido. Its range in Mongolia is unclear as there have been only a few collections of this species from the Khentey Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Ditestolepis quarta* Karpenko 1983, *Ecrinolepis mirabilis* Spassky and Karpenko 1983, *Mathevolepis larbi* Karpenko 1982, *Neoskrjabinolepis schaldybini* Spassky 1947, *Soricinia bargusina* Eltyshev 1975, *Soricinia collaris* Karpenko 1984, *Soricinia macrospina* Karpenko 1984, *Spasskylepis pheodorovi* Karpenko 1984, *Vigisolepis amurensis* Karpenko 1984; NEMATA - *Soboliphyme baturini* larval Petrow 1930; *Stefanskostrongylus mascomai* Kontrimavichus & Delyamure 1979.

Literature.—Kontrimavichus & Delyamure 1979; Domnich 1982; Karpenko 1982; Karpenko 1983; Spassky and Karpenko 1983; Domnich 1984; Karpenko 1984a; Karpenko 1984b; Karpenko 1984c; Karpenko 1989; Afanaseva 1993; Tinnin et al. 2002; Ganzorig et al. 2003.

***Sorex minutissimus* Zimmerman 1780**
Miniscule Shrew

Distribution.—The miniscule shrew ranges from Scandinavia to Siberia, south into Mongolia, China and South Korea, as well as onto the islands of

Sakhalin and Hokkaido. In Mongolia they are found across the mountain and steppes in the northern half of the country.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Mathevolepis larbi* Karpenko 1982, *Neoskrjabinolepis schaldybini* Spassky 1947, *Soricinia macrospina* Karpenko 1984, *Staphylocystis sibirica* (Morozov 1957), *Zarnowskiella stefanskii* (Zarnowski 1954).

Literature.—Morozov 1957; Eltyshev 1975; Karpenko 1982; Karpenko 1984a; Karpenko 1989; Karpenko and Chechulin 1990; Tinnin et al. 2002.

***Sorex roboratus* Hollister 1913**
Flat-skulled Shrew

Distribution.—This species is found from Russia across to Mongolia and China. In Mongolia, the flat-skulled shrew is restricted to the extreme north in the Khentey and Hovsgol Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Ditestolepis quarta* Karpenko 1983, *Lineolepis borealis* Karpenko and Shakhmatova 1985, *Mathevolepis larbi* Karpenko 1982, *Soricinia aporalis* Karpenko 1984, *Soricinia collaris* Karpenko 1984, *Soricinia macrospina* Karpenko 1984, *Spasskylepis pheodorovi* Karpenko 1984, *Zarnowskiella stefanskii* (Zarnowski 1954).

Literature.—Karpenko 1982; Karpenko 1983; Karpenko 1984a; Karpenko 1984c; Karpenko and Shakhmatova 1985; Karpenko and Chechulin 1990; Tinnin et al. 2002; Hutterer 2005b.

***Sorex tundrensis* Merriam 1900**
Tundra Shrew

Distribution.—The tundra shrew ranges from western China across Beringia into Alaska and Canada. In Mongolia this shrew is found in across the mountains and steppes in the northern half of the country.

Parasites.—In Mongolia: None currently known. Across range: NEMATA - *Soboliphyme baturini* larval Petrow 1930.

Comments.—Karpenko et al. (2007) also discovered that *S. tundrensis* serves as a paratenic host for *Soboliphyme baturini*. See comments under *Sorex daphaenodon*.

Literature.—Tinnin et al. 2002; Hutterer 2005b; Karpenko et al. 2007.

Talpidae
Talpa altaica Nikolsky 1883
Altai Mole

Distribution.—The Altai mole ranges across western and central Siberia into Mongolia. In Mongolia, they are only known from the Hovsgol and northern Great Lakes region.

Parasites.—In Mongolia: None currently known. Across range: NEMATA - *Tricininella* sp..

Literature.—Fedorov 1976; Tinnin 2002; Hutterer 2005b.

CHIROPTERA
Vespertilionidae
Eptesicus bottae (Peters 1869)
Botta's Bat

Distribution.—Botta's bat ranges from Greece into the Middle East, through Central Asia to Pakistan and China. Although this species has been reported as occurring in Mongolia, its distribution within the country is unknown.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Simmons 2005.

Eptesicus gobiensis Bobrinskii 1926
Gobi Bat

Distribution.—The Gobi bat is found from Tajikistan east through Mongolia and northwest China. In Mongolia the Gobi bat ranges south from the Khangay Mountains, into the eastern Mongolian Altai, Gobi Altai and southeastern parts of the country.

Parasites.—In Mongolia: NEMATA - *Litomosa* sp.; TREMATODA - *Plagiorchis vespertilionis* (Müller 1780). Across range: No other helminths are known from this bat.

Literature.—Tinnin et al. 2002; Tinnin et al. 2008.

Eptesicus nilssoni (Keyserling and Blasius 1839)
Nilsson's Bat

Distribution.—Nilsson's bat ranges from Europe across Russia and into Mongolia and China. In Mongolia, this species ranges across the mountains and steppes in the northern half of the country.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Vampirolepis balsaci* (Joyeux and Baer 1934), *Vampirolepis ezoensis* Sawada 1990; TREMATODA - *Lecithodendrium chosenicum* Ogata 1941, *Lecithodendrium granulosum* Looss 1907, *Lecithodendrium hovorkai* Mituch 1959, *Lecithodendrium linstowi* Dollfus 1931, *Lecithodendrium mystacini* Zdzitowiecki 1969, *Lecithodendrium spathulatum* (Ozaki 1929), *Plagiorchis eptesici* Ogata 1941, *Plagiorchis vespertilionis* (Müller 1780), *Prosthodendrium ascidia* (Beneden 1873), *Prosthodendrium aelleni* Dubois 1956, *Prosthodendrium longiforme* (Bhalero 1926), *Pycnoporos megacotyle* (Ogata 1939).

Literature.—Ogata 1941; Spassky, Ryjnikov and Sudarikov 1952; Dubois 1956; Mituch 1959; Zdzitowiecki 1969; Zdzitowiecki 1970a; Sawada 1990; Tinnin et al. 2002; Simmons 2005; Tinnin et al. 2008.

Eptesicus serotinus Schreber 1775
Serotine

Distribution.—The Serotine ranges from North Africa and Europe across southern Asia to south-eastern China. In Mongolia they are known from the southern Gobi.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Macracanthorhynchus hirudinaceus* (Pallas 1781); CESTODA - *Hymenolepis christensoni* Macy 1931, *Myotolepis*

crimensis (Skarbilovitsch 1946), *Myotolepis grisea* (van Beneden 1873), *Staphylocystis syrdariensis* (Skarbilovitsch 1946), *Vampirolepis acuta* (Rudolphi 1819), *Vampirolepis balsaci* Joyeux and Baer 1934, *Vampirolepis rysavyi* Tenora and Barus 1960, *Vampirolepis skjabinariana* (Skarbilovitsch 1946); NEMATODA - *Litosoma* sp., *Molinostrongylus alatus* (Ortlepp 1932), *Physaloptera myotis* Babos 1955, *Rictularia bovieri* Blanchard 1886, *Strongylacantha glycirrhiza* (van Beneden 1873); TREMATODA - *Allassogonoporus amphoraeformis* (Mödlinger 1930), *Castroia nyctali* Gvozdev 1953, *Lecithodendrium hovorkai* Mituch 1959, *Lecithodendrium granulosum* Looss 1907, *Lecithodendrium linstowi* Dollfus 1931, *Lecithodendrium spathulatum* (Ozaki 1929), *Ophiosacculus eptesicus* Matsaberidze and Khotenovskii 1966, *Ophiosacculus mehelyi* (Mödlinger 1930), *Parabascus duboisi* (Hurkova 1961), *Parabascus lepidotus* Loos 1907, *Plagiorchis asper* Stossich 1904, *Plagiorchis koreanus* Ogata 1938, *Plagiorchis vespertilionis* (Müller 1780), *Mesotretes peregrinus* (Braun 1900), *Prosthodendrium ascidia* (Beneden 1873), *Prosthodendrium aelleni* Dubois 1956, *Prosthodendrium carolinum* Hurkova 1959, *Prosthodendrium chilostomum* (Mehlis 1831), *Prosthodendrium ilei* Zdzitowiecki 1969, *Prosthodendrium longiforme* (Bhalerao 1926), *Pycnoporos heteroporus* (Dujardin 1845), *Pycnoporos megacotyle* (Ogata 1939), *Prosthodendrium magnum* Rysavy 1956.

Literature.—Ogata 1938; Dubois 1956; Mituch 1959; Soltys 1959; Tenora and Barus 1960; Matsaberidze and Khotenovskii 1966; Kurashvili 1967; Andreiko and Skvortsov 1968; Zdzitowiecki 1969; Skvortsov 1970; Zdzitowiecki 1969; Groschaft and Tenora 1973; Chiriac and Barbu 1973; Groschaft and Tenora 1974; Tkach et al. 1985; Tokobaev 1976; Khotenovskii 1978; Sawada 1990; Alvarez et al. 1991; Tkach and Swiderski 1996; Shimalov et al. 2002; Simmons 2005.

***Myotis brandti* (Eversmann 1845)**
Brandt's Myotis

Distribution.—This bat is found across Europe and Asia. In Mongolia it is found in the Khentey and Khangay Mountains as well as in the steppes of the northeastern part of the country.

Parasites.—In Mongolia: None currently known. Across range: TREMATODA - *Plagiorchis elegans* (Rudolphi 1802), *Plagiorchis koreanus* Ogata 1938, *Plagiorchis muelleri* Tkach and Sharpilo 1990, *Plagiorchis vespertilionis* (Müller 1780), *Lecithodendrium linstowi* Dollfus 1931, *Prosthodendrium ascidia* (Beneden 1873), *Prosthodendrium chilostomum* (Mehlis 1831), *Prosthodendrium longiforme* (Bhalerao 1926), *Parabascus duboisi* (Hurkova 1961).

Comments.—Five individuals from Mongolia were examined by Tinnin et al. (2008), but they were uninfected.

Literature.—Ogata 1938; Tinnin et al. 2002, Demidova and Vekhnik 2004; Simmons 2005.

***Myotis daubentonii* (Kuhl 1819)**
Daubenton's Myotis

Distribution.—Daubenton's bat is found from the British Isles across Europe and northern Asia to Japan, as far south as India. In Mongolia it is known from Lake Hovsgol, the Khentey, Khangay, and western Altai Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Hymenolepis christensoni* Macy 1931; NEMATODA - *Capillaria neopulchra* Babos 1954, *Capillaria romana* Ricci 1949, *Molinostrongylus daubentonii* Zdzitowiecki 1970, *Molinostrongylus spasskii* Andreiko et al. 1968, *Physaloptera myotis* Babos 1955; TREMATODA - *Plagiorchis vespertilionis* (Müller 1780), *Lecithodendrium linstowi* Dollfus 1931, *Limatulum duboisi* Hurkova 1961 see *eptesicus*, *Parabascus joannae* (Zdzitowiecki 1967), *Parabascus minor* Khotenovskii 1985, *Parabascus semisquamatus* (Braun 1900), *Prosthodendrium carolinum* Hurkova 1959, *Prosthodendrium chilostomum* (Mehlis 1831), *Prosthodendrium hurkovaee* Dubois 1960, *Prosthodendrium ilei* Zdzitowiecki 1969, *Prosthodendrium longiforme* (Bhalerao 1926).

Comments.—Tinnin et al. (2008) examined 6 individuals from Mongolia, which were uninfected.

Literature.—Hurkova 1959; Soltys 1959; Dubois 1960; Hurkova 1961; Matskasi 1967; Zdzitowiecki 1967a; Andreiko and Skvortsov 1968; Andreiko et al. 1968; Zdzitowiecki 1969; Zdzitowiecki 1970b; Groschaft and Tenora 1973; Bakke and Mehl 1977; Khotenovskii 1985; Tkach et al. 1985; Tkach et al. 2000; Tinnin et al. 2002; Shimalov et al. 2002; Tinnin et al. 2008

***Myotis ikkonikovi* Ognev 1912**
Ikkonikov's Bat

Distribution.—Ikkonikov's bat is known from eastern Russia south through Mongolia, China, and Korea, as well as Japan. In Mongolia this bat has only been found on the eastern border of the country in the Ikh Hyangan Mountains, and from along the Orkhon river in the north central part of the country.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Simmons 2005; Dolch et al. 2007; Batsaikhan et al. 2010.

***Myotis mystacinus* (Kuhl 1817)**
Whiskered Bat

Distribution.—The whiskered bat is known from across Eurasia into Southeast Asia. In Mongolia they are found across the country.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Pseudandrya myotisi* Shinde and Solunke 1983, *Vampirolepis balsaci* (Joyeux and Baer 1934), *Vampirolepis novadomensis* Rysavy 1971; NEMATA - *Capillaria romana* Ricci 1949, *Molinostrongylus vespertilionis* Morozov and Spassky 1961, *Rictularia bovieri* Blanchard 1886; TREMATODA - *Acanthatrium tatrense* Zdzitowiecki 1967, *Allasogonoponts amphoraeformis* (Mödlinger 1930), *Lecithodendrium hovorkai* Mituch 1959, *Lecithodendrium linstowi* Dollfus 1931, *Lecithodendrium mystacini* Zdzitowiecki 1969, *Limatulum duboisi* Hurkova 1961, *Parabascus minor* Khotenovskii 1985, *Plagiorchis amplexaustoria* Mituch 1964, *Plagiorchis koreanus* Ogata 1938, *Plagiorchis vespertilionus* (Müller 1780), *Prosthodendrium ascidia* (Beneden 1873),

Prosthodendrium carolinum Hurkova 1959, *Prosthodendrium longiforme* (Bhalero 1926), *Prosthodendrium parvouterus* (Bhalero 1926).

Literature.—Ogata 1938; Dubois 1956; Hurkova 1959; Mituch 1959; Hurkova 1961; Mituch 1964a; Andreiko and Skvortsov 1968; Zdzitowiecki 1967b; Zdzitowiecki 1969; Zdzitowiecki 1970a; Zdzitowiecki 1970b; Rysavy 1971; Skvortsov 1971; Yanchev and Stoikova 1973; Tokobaev 1976; Barus and Tenora 1977; Shinde and Solunke 1983; Khotenovskii 1985; Tkach and Swiderski 1996; Tkach 2000; Tinnin et al. 2002; Demidova and Vekhnik 2004; Simmons 2005.

***Nyctalus noctula* (Schreber 1774)**
Noctule

Distribution.—The noctule is known from across Eurasia into Southeast Asia. In Mongolia they are only currently known from the Great Lakes Region.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Hymenolepis christensoni* Macy 1931, *Vampirolepis baeri* Murai 1976, *Vampirolepis acuta* (Rudolphi 1819), *Vampirolepis skrjabinariana* (Skarbilovitsch 1946), *Vampirolepis spasskii* Andreiko et al. 1969; NEMATA - *Capillaria neopulchra* Babos 1954, *Ascarops strongylina* larval (Rudolphi 1819), *Molinostrongylus skrjabini* (Ortlepp 1932), *Molinostrongylus tipula* (Beneden 1873), *Physocephalus sexalatus* larval (Molin 1860), *Physaloptera myotis* Babos 1955, *Riouxgolyvania nyctali* Bain and Chabaud 1979, *Skrjabinocapillaria eubursata* Skarbilovich 1946, *Spinostongylus johnstoni* Trivedi and Gupta 1990, *Spirocera lupi* larval (Rudolphi 1809); TREMATODA - *Castroia nyctali* Gvozdev 1953, *Lecithodendrium granulosum* Looss 1907, *Lecithodendrium linstowi* Dollfus 1931, *Lecithodendrium macrostomum* (Ozaki 1929), *Lecithodendrium rysavyi* Dubois 1960, *Lecithodendrium spathulatum* (Ozaki 1929), *Parabascus semisquamosus* (Braun 1900), *Plagiorchis asper* Stossich 1904, *Plagiorchis vespertilionus* (Müller 1780), *Prosthodendrium ascidia* (Beneden 1873), *Prosthodendrium chilostomum* (Mehlis 1831), *Prosthodendrium ilei* Zdzitowiecki 1969, *Prosthodendrium longiformes* (Bhalero 1926), *Prosthodendrium raabei* (Soltys 1959), *Pycnoporos heteroporos* (Dujardin 1845), *Pycnoporos megacotyle* (Ogata 1939), *Prosthodendrium magnum* Rysavy 1957.

Comments.—Sharpilo et al. (1996) discussed how *Nyctalus* serves as “trap host”, a dead-end paratenic host, as the parasite cannot be transmitted to definitive host from such species for *Ascarops strongylina*, *Physocephalus sexalatus*, and *Spirocerca lupi*.

Literature.—Gvozdev 1953; Soltys 1959; Dubois 1960; Dancu and Capuse 1966; Manskasi 1967; Andreiko et al. 1969; Zdzitowiecki 1969; Skvortsov 1970; Zdzitowiecki 1970a; Groschaft and Tenora 1973; Chiriac and Barbu 1973; Yanchev and Stoikova 1973; Guildal 1976; Murai 1976; Tokobaev 1976; Khotenovskii 1978; Bain and Chabaud 1979; Erkulov and Moldopiyazova 1986; Trivedi and Gupta 1990; Genov et al. 1992; Sharpilo et al. 1996; Tinnin et al. 2002; Simmons 2005; Tinnin et al. 2008.

***Hypsugo alashanicus* Bobrinskii 1926**
Alashan Bat

Distribution.—The Alashan bat is found in eastern Siberia, Mongolia, China, Korea, and Japan. In Mongolia they are found in the Gobi Altai, and desert and steppe regions in the southwestern part of the country.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Simmons 2005.

***Plecotus auritus* (Linnaeus 1758)**
Brown Big-eared Bat

Distribution.—Members of this species are found from Norway, Ireland, and Spain across to Sakhalin Island and Japan, south into China and Nepal. In Mongolia it is found in the northern steppe and forest-steppe regions.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Vampirolepis balsaci* (Joyeux and Baer 1934), *Vampirolepis ozensis* Sawada 1980; NEMATODA - *Capillaria* sp., *Litomosia filaria* (Beneden 1873), *Molinostrongylus skrjabini* (Ortlepp 1932), *Seuratium mucronatum* (Rudolphi 1809); TREMATODA - *Acanthatrium sogandaresi* Coil and Kuntz 1958, *Acantharium tatense* Zdzitow-

iecki 1967, *Lecithodendrium linstowi* Dollfus 1931, *Parabascus lepidotus* Loos 1907, *Parabascus minor* Khotenovskii 1985, *Plagiorchis vespertilionus* (Müller 1780), *Prosthodendrium chilostomum* (Mehlis 1831), *Prosthodendrium longiforme* (Bhalerao 1926).

Comments.—A preliminary analysis of the genus *Plecotus* conducted by Spitzberger et al. (2006) based on morphological and molecular data suggested that *P. auritus* found in Mongolia and Siberia should be recognized as *Plecotus ognevi* Kishida 1927. Pending further analyses we retain it here as *P. auritus*, but make mention of this fact as some recent publications recognized the revision. Currently, there are no known endo-parasites known from the nominal *P. ognevi*.

Literature.—Desportes 1946; Biocca and Chabaud 1951; Spassky, Ryjnikov and Sudarikov 1952; Coil and Kuntz 1958; Soltys 1959; Andreiko and Skvortsov 1968; Zdzitowiecki 1969; Skvortsov 1970; Zdzitowiecki 1970a; Tokobaev 1976; Sawada 1980; Khotenovskii 1985; Sawada 1990; Tkach et al. 2000; Shimalov et al. 2002; Tinnin et al. 2002; Spitzberger et al. 2006; Dolch et al. 2007; Tinnin et al. 2008; Bat-saikhan et al. 2010.

***Plecotus austriacus* (Fischer 1899)**
Grey Big-eared Bat

Distribution.—The grey big-eared bat ranges from Europe east to China. In Mongolia they are known from the southern Khangay and Mongolian Altai across the south of the country.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Vampirolepis acuta* (Rudolphi 1819); TREMATODA - *Plagiorchis vespertilionus* (Müller 1780), *Prosthodendrium parvouterus* (Bhalerao 1926).

Comments.—Similarly to *P. auritus*, Spitzberger et al. (2006) suggested that *Plecotus kozlovi* Bobrinskii 1926 should be recognized as the form inhabiting Mongolia. In addition, Spitzberger also recognized *Plecotus strelkovi* Spitzberger 2006 and *P. turkmenicus* Strelkov 1988 as valid species separate from *P. austriacus*, both of which have been reported from southern Mongolia. See comments above. Currently, there are no known

endo-parasites known from the nominal species *P. kozlovi*, *P. strelkovi*, or *P. turkmenicus*.

Literature.—Yanchev and Stoikova 1973; Murai 1976; Shimalov et al. 2002; Tinnin et al. 2002; Simmons 2005; Spitzberger et al. 2006; Dolch et al. 2007; Batsaikhan et al. 2010.

Vespertilio murinus (Linnaeus 1758)
Particolored Bat

Distribution.—The particolored bat is found from Norway and Britain to the Ussuri region of Russia, south into Afghanistan, Mongolia, and China. In Mongolia this species is known from scattered locations in the Khentey, Khangay, and Altai Mountains, as well as the southern Gobi Desert and eastern steppe areas.

Parasites.—In Mongolia: *Plagiorchis vespertilionus* (Müller 1780). Across range: NEMATA - *Litomosa ottaviani* Lagrange and Bettini 1948, *Litomosa vaucheri* Petit 1980, *Rictularia bovieri* Blanchard 1886; TREMATODA - *Parabascus magnitestis* Khotenovskii 1985, *Plagiorchis vespertilionus* (Müller 1780), *Prosthodendrium ilei* Zdzitowiecki 1969.

Literature.—Blanchard 1886; Lagrange and Bettini 1948; Khotenovskii 1985; Tkach 1989; Tkach and Swiderski 1996; Petit 1980; Tkach et al. 2000; Tinnin et al. 2002; Dolch et al. 2007; Tinnin et al. 2008; Batsaikhan et al. 2010.

Vespertilio sinensis (Peters 1880)
Asian Particolored Bat

Distribution.—This species is known from far eastern Russia south through China, Korea, and Japan. In Mongolia they are only known from riparian and lake habitats in the eastern steppes.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Vampirolepis multihamata* Sawada 1967; TREMATODA - *Prosthodendrium thomasi* Soganderes-Bernal 1956, *Acantharium jonesi* Soganderes-Bernal 1956.

Literature.—Soganderes-Bernal 1956; Sawada 1967; Sawada 1990; Sawada and Harada 1998; Tinnin et al. 2002; Simmons 2005; Batsaikhan et al. 2010.

Murina leucogaster Milne-Edwards 1872
Greater Tube-nosed Bat

Distribution.—This species ranges from southern Siberia through South-East Asia. In Mongolia they are found in the northern Khentey Mountains and Hovsgol Lake.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Simmons 2005.

RODENTIA
Sciuridae

Marmota baibacina Kastschenko 1889
Gray Marmot

Distribution.—The gray marmot ranges from Kyrgyzstan through Kazakhstan, southern Russia and into Mongolia, and China. In Mongolia it is only found in a small area of the northwest Mongolian Altai.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Ctenotaenia marmotae* (Frölich 1802), *Paranoplocephala ryjikovi* Spassky 1950, *Anoplocephaloides transversaria* (Krabbe 1879); NEMATA - *Ascaris tarbagan* Schulz 1931, *Citellina alatau* Spassky, Rhyzhikov and Sudarikov 1950, *Citellina kapitonovi* Gvozdev and Sharpilo 1978, *Dictyocaulus filaria* (Rudolphi 1809), *Ostertagiella circumcincta* (Stadelmann 1894), *Tricocephalus surka* (Garkavi 1950); TREMATODA - *Dicrocoelium lanceatum* Stiles and Hassall 1896

Comments.—Lin et al. (1982) reported that the oribatid mites *Scheloribates chauhani*, *Scheloribates* sp., and *Parakalumma lydia* served as intermediate hosts for *Anoplocephaloides transversaria* in China.

Literature.—Schulz 1931; Spassky 1950; Tokobaev 1976; Gvozdev and Sharpilo 1978; Lin et al. 1982; Tinnin et al. 2002; Thorington and Hoffmann 2005.

Marmota sibirica (Radde 1862)
Tarbagan

Distribution.—The tarbagan marmot ranges from Kirghizia and Kazakhstan into southern Siberia and across into Mongolia and China. In Mongolia it is found in the mountains and steppes of the northern part of the country.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis clarki* (Ward 1917); CESTODA - *Ctenotaenia marmotae* (Frölich 1802); NEMATA - *Ascaris tarbagan* Schulz 1931. Across range: ACANTHOCEPHALA - *Macracanthorhynchus catulinus* Kostylew 1927, *Moniliformis clarki* (Ward 1917); CESTODA - *Anoplocephaloides transversaria* (Krabbe 1879), *Ctenotaenia marmotae* (Frölich 1802), *Mesocestoides lineatus* (Goeze 1782); NEMATA - *Abbreviata leiperi* (Skrjabin 1924), *Ascaris tarbagan* Schulz 1931, *Citellina schulzi* Korneev 1954, *Physaloptera massino* Schulz 1926, *Streptopharagus* sp., *Trichuris syrca* Garkavi 1951.

Literature.—Schulz 1931; Machulsky 1958; Barus, Kullmann, and Tenora 1970; Sulimov and Obukhov 1975; Meszaros 1974; Zhaltanova et al. 1980; Zhaltanova and Shalaeva 1990; Ganzorig et al. 1998; Tinnin et al. 2002; Ganzorig et al. 2007; Tinnin et al. 2008.

Sciurus vulgaris Linnaeus 1758
Eurasian Red Squirrel

Distribution.—This squirrel is found in forest habitats across the Palearctic. In Mongolia, it is found in the forest of the northern mountain regions.

Parasites.—In Mongolia: *Catenotaenia dendritica* (Goeze 1782). Across range: CESTODA - *Catenotaenia dendritica* (Goeze 1782), *Cladotaenia globifera* larval (Batsch 1786), *Hymenolepis arvicolina* Cholodkowsky 1912, *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis horrida* (Linstow 1901), *Multiceps serialis* larval (Gervais 1847), *Paranoplocephala longivaginata* Chechulin and Gulyaev 1998, *Paranoplocephala omphalodes* (Hermann 1783), *Taenia polyacantha* larval Leuckart 1856, *Taenia crassiceps* larval (Zeder 1800); NEMATA - *Acanthoxyurus sciuri*

rorum Galli-Valerio 1932, *Aspiculuris dinniki* Schulz 1927, *Aspiculuris tetraptera* (Nitzsch 1821), *Capillaria hepatica* (Bancroft 1893), *Citellina levini* Li 1933, *Citellinema orientale* Schulz 1933, *Enterobius apapillus* Skrjabin and Schikhobalova 1951, *Enterobius sciuri* Cameron 1932, *Heligmosomum ussuriensis* Lubimov 1932, *Mastophorus muris* (Gmelin 1790), *Mastophorus petrowi* Belayeva 1959, *Physalopteria schulzi* (Lubimov 1935), *Rictularia skrjabini* Matchulskii and Wosnesenskaja 1967, *Syphabulea mascomai* Hugot and Feliu 1990, *Syphacia* sp., *Syphacia sobolevi* Gubanov 1964, *Syphacia tjanschani* Ablasov 1962, *Syphacia toschevi* Petrov and Bayanov 1962, *Syphacia ungula* (Linstow 1907), *Thominox sadovskajae* Morozov 1959, *Trichostrongylus retortaeformis* (Zeder 1809); TREMATODA - *Dicrocoelium dendriticum* (Rudolphi 1819), *Opisthioglyphe exasperatum* (Rudolphi 1819).

Comments.—Dollfus (1951) regarded his report of 3 adult *Hymenolepis diminuta* in one squirrel to be an accidental infection in a captive host.

Literature.—Schulz 1927; Galli-Valerio 1932; Li 1933; Dollfus 1948; Dollfus 1951; Spassky, Ryzhikov and Sudarikov 1952; Chabaud 1956; Machulsky 1958; Belayeva 1959; Ablasov 1962; Petrov and Bayanov 1962; Horning 1963; Gubanov 1964; Matchulskii and Wosnesenskaja 1967; Hartwich 1971; Eltyshiev 1975; Rocamora et al. 1978; Chiriac and Popescu 1982; Sharpilo and Lugovaya 1984; Hugot and Feliu 1990; Zhaltanova and Shalaeva 1990; Chechulin and Gulyaev 1998; Ganzorig et al. 1999; Shimalov and Shimalov 2002; Tinnin et al. 2002.

Spermophilus alashanicus Buchner 1888
Alashan Ground Squirrel

Distribution.—The Alashan ground squirrel has a narrow distribution across the Alashan and Tien Shan Mountains of China and the Gobi Altai of Mongolia. This species is restricted to the Gobi Altai in Mongolia.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Comments.—Vuitton et al. (1998) indicated that a previous report of larval *Echinococcus multilocularis*

Leuckart 1863 found in *Spermophilus alashanicus* in China may possibly have been from *Spermophilus dauricus*.

Literature.—Vuitton et al. 1998; Tinnin et al. 2002.

***Spermophilus dauricus* Brandt 1843**
Daurian Ground Squirrel

Distribution.—The Daurian ground squirrel ranges from Transbaikalia south through Mongolia and China. In Mongolia it is found in the eastern steppes of the country.

Parasites.—In Mongolia: None currently known. Across range: *Echinococcus multilocularis* Leuckart 1863.

Comments.—Vuitton et al. (1998) indicated that a previous report of larval *Echinococcus multilocularis* Leuckart 1863 found in *Spermophilus alashanicus* in China may possibly have been from *Spermophilus dauricus*. A further survey for *E. multilocularis* in Ningxia China showed that although 27% of *Vulpes vulpes* were infected, only 0.2% (3 of 1500) *O. dauricus* and none of the other 12 rodent species examined were infected (Li et al. 1985).

Literature.—Li et al. 1985; Vuitton et al. 1998; Tinnin et al. 2002; Thorington and Hoffmann 2005.

***Spermophilus pallidicauda* (Satunin 1903)**
Pallid Ground Squirrel

Distribution.—The Pallid ground squirrel ranges across Mongolia and Inner Mongolia, China. In Mongolia this species is found from the Great Lakes region to the eastern border of the country in desert and desert-steppe habitats.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Comments.—This ground squirrel has frequently been listed as a subspecies of the *Spermophilus erythrogenys* Brandt 1841, but is currently regarded as a separate species (Harrison et al. 2003; Thorington

and Hoffmann 2005). Currently, the status of *S. pallidicauda* as well as the existence of the other putative species in the group, *S. erythrogenys* and possibly *S. brevicauda*, within the country merit additional investigation.

Literature.—Tinnin et al. 2002; Harrison et al. 2003; Thorington and Hoffmann 2005.

***Spermophilus undulatus* Pallas 1778**
Long-tailed Ground Squirrel

Distribution.—The long-tailed ground squirrel ranges from eastern Kazakhstan across southern Siberia and into Mongolia and China. In Mongolia this species is found in the steppes of the Khangay and Khentey Mountains, the Mongolian Altai, and from the vicinity of Lake Hovsgol.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis clarki* (Ward 1917); CESTODA - *Anoplocephaloides transversaria* (Krabbe 1879), *Ctenotaenia citelli* (Kirschenblatt 1939), *Ctenotaenia marmotae* (Frölich 1802), *Hymenolepis suslica* Shal'dybin 1965, *Mesocostoides* sp.; NEMATA - *Ascaris tarbagan* Schulz 1931, *Physaloptera massino* Schulz 1926, *Streptopharagus kutassi* (Schultz 1927). Across range: ACANTHOCEPHALA - *Macracanthorhynchus catulinus* Kostylew 1927, *Moniliformis clarki* (Ward 1917), *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Anoplocephaloides transversaria* (Krabbe 1879), *Aprostandrya macrocephala* (Douthitt 1915), *Ctenotaenia cricetorum* Kirschenblatt 1949, *Ctenotaenia citelli* (Kirschenblatt 1939), *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis megaloon* (Linstow 1901), *Hymenolepis suslica* Shal'dybin 1965, *Mesocostoides lineatus* (Goeze 1782), *Paranoplocephala brevis* Kirschenblatt 1938, *Paranoplocephala dentata* (Galli-Valerio 1905), *Taenia solium* larval Linnaeus 1758; NEMATA - *Abbreviata leiperi* (Skrjabin 1924), *Ascaris joffi* Schulz 1931, *Ascaris tarbagan* Schulz 1931, *Ascarops tuvensis* Sulimov 1961, *Baylisascaris laevis* (Leidy 1856), *Capillaria armeniaca* Kirschenblatt 1939, *Capillaria sibirica* Romanov 1960, *Mastophorus muris* (Gmelin 1790), *Physaloptera citilli* (Rudolphi 1819), *Physaloptera massino* Schulz 1926, *Physaloptera soricina* Baylis 1934, *Protospirura*

suslica Schulz 1927, *Streptopharagus kutassi* (Schultz 1927), *Streptopharagus* sp., *Subulura citelli* Sulimov 1961, *Syngamus citelli* Ryzhikov 1956, *Syphacia obvelata* (Rudolphi 1802), *Trichinella spiralis* (Owen 1935), *Trichostrongylus colubriformis* (Giles 1892), *Trichuris citellorum* (Kirschenblatt 1939), *Trichuris muris* (Schrunk 1788); TREMATODA - *Plagiorchis eutamiatjs* Schulz 1932, *Plagiorchis muris* Tanabe 1922.

Literature.—Schulz 1931; Spassky, Ryzhikov and Sudarikov 1952; Ryzhikov 1956; Machulsky 1958; Romanov 1960; Sulimov 1961; Shaldybin 1965; Nadtochi et al. 1966; Gvozdev et al.; 1970; Eltyshev and Maklokov 1971; Eltyshev 1975; Tokobaev 1976; Shalaeva et al. 1987; Bessinov 1998; Ganzorig et al. 1998; Ganzorig et al. 1998b; Tinnin et al. 2002; Zhaltanova and Shalaeva 2004; Ganzorig et al. 2007.

***Tamias sibiricus* (Laxmann 1769)**
Siberian Chipmunk

Distribution.—The Siberian chipmunk occurs across northern Europe through Siberia and south into Kazakhstan, Mongolia, and China, as well as on Sakhalin, Hokkaido, and the Kuriles. In Mongolia they are found in the taiga and mountain forests of the Khentey, Khangay Mountains and the Mongolian Altai. An additional population is also known from the Nomrog River in eastern Mongolia.

Parasites.—In Mongolia: CESTODA - *Passerilepis passeris* Gmelin 1790; NEMATODA - *Syphacia* sp. Across range: ACANTHOCEPHALA - *Macracanthorhynchus catulinus* larval Kostylew 1927; CESTODA - *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis horrida* (Linstow 1901), *Hymenolepis* sp., *Mesocostoides* sp. larval, *Paranoplocephala omphalodes* (Hermann 1783); NEMATODA - *Brevistriata bergerardi* Durette-Desset 1970, *Capillaria hepatica* (Bancroft 1893), *Capillaria sibirica* Romanov 1960, *Citellinema orientale* Schulz 1933, *Heligmosomum ussuriensis* Lubimov 1932, *Physaloptera massino* Schulz 1926, *Rauschivngylus asiaticus* Domnich 1984, *Rictularia amurensis* Schulz 1927, *Spiruracerca petrovi* Gubanov 1964, *Streptopharagus kutassi* (Schultz 1927), *Thominx sadovskajae* Morozov 1959; Trematoda - *Dicrocoelium lanceatum* Stiles and Hassall 1896, *Plagiorchis euta-*

miatis Schulz 1932.

Comments.—Ganzorig et al. (1998b) discovered the cestode *Passerilepis passeris*, normally found in passerine hosts, in a chipmunk in the Hovsgol area.

Literature.—Schulz 1932; Schulz 1933; Spassky, Ryzhikov and Sudarikov 1952; Machulsky 1958; Romanov 1960; Gubanov 1964; Durette-Desset 1970a; Eltyshev 1975; Domnich 1984b; Asakawa and Ohbayashi 1986a; Zhaltanova and Shalaeva 1990; Ganzorig et al. 1998b; Tinnin et al. 2002; Batsaikhan et al. 2010.

***Pteromys volans* (Linnaeus 1758)**
Siberian Flying Squirrel

Distribution.—The Siberian flying squirrel ranges from Scandinavia across Siberia to Hokkaido and Sakhalin, and south into China. In Mongolia they are found in the Mongolian Altai, Hovsgol, and the Khangay and Khentey Mountains.

Parasites.—In Mongolia: None currently known. Across range: *Citellina petrowi* Schulz 1930.

Literature.—Spassky, Ryzhikov and Sudarikov 1952; Machulsky 1958; Tinnin et al. 2002; Thorington and Hoffmann 2005.

Castoridae
***Castor fiber* (Linnaeus 1758)**
Eurasian Beaver

Distribution.—The beaver is found across northern Eurasia. In Mongolia they are only known from the Djungarian Desert in the southwestern corner of the country; they have been reintroduced into the Mongolian Altai and Khangay Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Echinococcus granulosus* larval (Batsch 1786), *Echinococcus multilocularis* larval Leuckart 1863, *Taenia hydatigena* larval Pallas 1766; NEMATODA - *Ascaris castoris* Rudolphi 1819, *Castorstrongylus castoris* Chapin 1925, *Trichostrongylus axei* (Cobbold 1879), *Trichostrongylus capricola* Ransom 1907, *Travassosius rufus* Khalil 1922; TREMATODA - *Echinostoma orlovi* Romashov 1967, Fasciola

hepatica Linnaeus 1758, *Opisthorchis felinus* (Rivolta 1884), *Psilotrema castoris* Orlov 1946, *Stichorchis subtriquetrus* (Rudolphi 1814).

Comments.—Markov et al. (1977) reported that among other demographic factors, river pollution has influenced infection rates of *Stichorchis subtriquetrus* and *Opisthorchis felinus* in the Volgograd region of Russia.

Literature.—Orlov 1946; Moskalev 1954; Romashov 1958; Potekhina and Belyaeva 1959; Joszt 1964; Romashov 1967; Romashov 1973; Romashov 1976; Sharpilo 1976; Markov et al. 1977; Solovev et al. 1983; Shimalov and Shimalov 2000; Tinnin et al. 2002; Janovsky et al. 2002; Koubkova et al. 2002; Maleika et al. 2003; Drozd et al. 2004; Helgen 2005.

Dipodidae

Allactaga balikunica Hsia and Fang 1964
Balikun Jerboa

Distribution.—The Balikun Jerboa is narrowly restricted to Xianjiang China and southwest Mongolia. In Mongolia this species is only known from the desert regions south of the Gobi Altai.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Holden and Musser 2005.

Allactaga bullata Allen 1925
Gobi Jerboa

Distribution.—The Gobi Jerboa ranges across southern Mongolia and northern China. In Mongolia it is known from the Valley of the Lakes, the Great Lakes region, and the desert and desert-steppe in the southern half of the country.

Parasites.—In Mongolia: *Mesocetoides lineatus* larval (Goeze 1782). Across range: No other helminths are known from this species.

Literature.—Danzan 1978; Ganzorig et al. 1998; Tinnin et al. 2002; Holden and Musser 2005.

Allactaga elater (Lichtenstein 1828)
Small Five-toed Jerboa

Distribution.—This species of jerboa is distributed from Iran east to northern China and southern Mongolia. In Mongolia it is narrowly restricted in the Djungarian region of the far west, south of the Gobi Altai.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Aprostataandrya caucasica* (Kirschenblatt 1938), *Catenotaenia cricetorum* Kirschenblatt 1949, *Catenotaenia dendritica* (Goeze 1782), *Echinococcus multilocularis* larval Leuckart 1863, *Taenia taeniaeformis* larval (Batsch 1786), *Mathevotaenia symmetrica* (Baylis 1927); NEMATA - *Abbreviata leiperi* (Skrjabin 1924), *Mastophorus muris* (Gmelin 1790), *Subulura turkmenica* Babaev 1967, *Syphacia obvelata* (Rudolphi 1802); TREMATODA - *Dicrocoelium lanceatum* Stiles and Hassall 1896.

Literature.—Sadikhov and Tarzhimanova 1965; Babaev 1967; Tokobaev 1976; Shakenov 1987; Tinnin et al. 2002; Holden and Musser 2005.

Allactaga sibirica (Forster 1778)
Mongolian Five-toed Jerboa

Distribution.—The Mongolian five-toed jerboa is widely distributed from the Caspian Sea to Transbaikalia, south through Mongolia into China. This species is found in forest- steppe, steppe, and semi-desert areas throughout Mongolia.

Parasites.—In Mongolia: NEMATA - *Kasabospirura steinmani* Meszaros 1975, *Skrjabinocerina petrowi* Matchulsky 1952. Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); NEMATA - *Eucoelus* sp., *Skrjabinocerina petrowi* Matchulsky 1952, *Streptopharagus* sp., *Subulura* sp.

Literature.—Matchulsky 1958; Meszaros 1975; Asakawa et al. 2001; Tinnin et al. 2002.

Cardiocranius paradoxus Satunin 1903
Five-toed Pygmy Jerboa

Distribution.—This species of jerboa ranges from the Tuva region of Russia south through eastern Kazakhstan, Mongolia, and China. In Mongolia it is found in the Great Lakes region, the Valley of the Lakes, and across the desert and desert-steppe in the southern part of the country.

Parasites.—In Mongolia: None currently known.
Across range: None currently known.

Literature.—Tinnin et al. 2002; Holden and Musser 2005.

Dipus sagitta (Pallas 1773)
Northern Three-toed Jerboa

Distribution.—The northern three-toed jerboa ranges from the northwest coast of the Caspian Sea south into Iran, east through Central Asia to the Tuva region of Russia, Mongolia and northern China. They are found in the Valley of the Lakes, the Great Lakes region, Gobi Altai, and throughout the desert and semi-desert regions of southern Mongolia.

Parasites.—In Mongolia: CESTODA - Mesocestoides lineatus (Goeze 1782). Across range: NEMATA - *Aspicularis tetraptera* (Nitzsch 1821), *Mastophorus muris* (Gmelin 1790), *Syphacia obvelata* (Rudolphi 1802).

Literature.—Tokobaev 1976; Ganzorig et al. 1998; Asakawa et al. 2001; Tinnin et al. 2002.

Euchoreutes naso Sclater 1891
Long-eared Jerboa

Distribution.—The long-eared jerboa is only found in southern Mongolia and northern China. In Mongolia this species is restricted to the Trans-Altai Gobi.

Parasites.—In Mongolia: None currently known.
Across range: NEMATA - *Subulura citelli* Sulimov 1961.

Literature.—Asakawa et al. 2001; Tinnin et al. 2002; Holden and Musser 2005.

Pygeretemus pumilio (Kerr 1792)
Dwarf Fat-tailed Jerboa

Distribution.—The fat-tailed jerboa ranges from Iran across Central Asia to Mongolia and China. In Mongolia they are found in the Great Lakes region, the Valley of the Lakes and the southeastern Gobi desert regions.

Parasites.—In Mongolia: None currently known.
Across range: None currently known.

Literature.—Tokobaev 1976; Tinnin et al. 2002.

Salpingotus crassicauda Vinogradov 1924
Thick-tailed Pygmy Jerboa

Distribution.—Members of this species range from eastern Kazakhstan into Mongolia and China. In Mongolia this pygmy jerboa is found in the Great Lakes region, the Valley of the Lakes and across the southern desert and desert steppe.

Parasites.—In Mongolia: None currently known.
Across range: None currently known.

Literature.—Tinnin et al. 2002; Holden and Musser 2005.

Salpingotus kozlovi Vinogradov 1922
Kozlov's Pygmy Jerboa

Distribution.—Kozlov's pygmy jerboa is found in southern Mongolia and northwestern China. In Mongolia it is restricted to the Trans-Altai southern Gobi deserts.

Parasites.—In Mongolia: None currently known.
Across range: None currently known.

Literature.—Tinnin et al. 2002; Holden and Musser 2005.

***Stylodipus andrewsi* Allen 1925**
Andrew's Three-toed Jerboa

Distribution.—Andrew's three-toed jerboa is only found in southern Mongolia and northern China. In Mongolia this species ranges from the Great Lakes and Valley of the Lakes through the desert-steppe in the south-central part of the country.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Holden and Musser 2005.

***Stylodipus sungorus* Sokolov and Shenbrot 1987**
Djungarian Three-toed Jerboa

Distribution.—The Djungarian three-toed jerboa is only found in southern Mongolia and northern China. In Mongolia it is restricted to the Djungarian desert in the southwestern corner of the country.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Holden and Musser 2005.

Cricetidae
Arvicolinae
***Alticola barakshin* Bannikov 1947**
Gobi Altai Mountain Vole

Distribution.—This species of vole ranges from the Tuva region of Russia south through Mongolia into China. In Mongolia they are found in the western Mongolian and Gobi Altai.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005.

***Alticola macrotis* (Radde 1862)**
Large-eared Mountain Vole

Distribution.—The large-eared vole ranges from the Altai Mountains of southern Siberia and northwest China through Tuva to the Lake Baikal area. In Mongolia this species of vole is found in the Altai of the west and in the Lake Hovsgol region.

Parasites.—In Mongolia: None currently known. Across range: Nemata - *Syphacia obvelata* (Rudolphi 1802).

Literature.—Machulsky 1958; Tinnin et al. 2002; Musser and Carleton 2005.

***Alticola semicanus* (Allen 1924)**
Mongolian Mountain Vole

Distribution.—The Mongolian mountain vole ranges from The Tuva region of Russia through north and central Mongolia into Inner Mongolia. In Mongolia this vole is commonly found from the Great Lakes region through the Khangay Mountains and east across the steppes of most of the country.

Parasites.—In Mongolia: CESTODA - *Aprostodrya* sp., *Hymenolepis horrida* (Linstow 1901), *Hymenolepis meszarosi* Murai and Tenora 1975, *Paranoplocephala dentata* (Galli-Valerio 1905); NEMATODA - *Cephaluris andrejevi* Schulz 1948, *Syphacia* sp. . Across range: None currently known.

Literature.—Murai and Tenora 1975; Ganzorig et al. 1998b; Tinnin et al. 2002.

***Alticola strelzowi* (Katschenko 1899)**
Strelzow's Vole

Distribution.—Strelzow's vole is found from Kazakhstan east into the Altai Mountains of Siberia, Mongolia and China. In Mongolia they are restricted to the Mongolian Altai in the far west of the country.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005.

Alticola tuvinicus Ognev 1950
Tuva Mountain Vole

Distribution.—The Tuva vole has a distribution from the Altai Mountains of Russia and Mongolia east through, of course, Tuva to Lake Baikal. In Mongolia they are found in the western Altai mountains and the Hovsgol region.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005.

Arvicola amphibius (=terrestris) (Linnaeus 1758)
Water Vole

Distribution.—The water vole ranges across Eurasia. In Mongolia they are only known from a few localities in the Mongolian Altai and Hovsgol.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Aprostotandrya macrocephala* (Douthitt 1915); CESTODA - *Cladotenia cylindrica* larval (Kreff 1873), *Echinococcus granulosus* larval (Batsch 1786), *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis horrida* (Linstow 1901), *Limnolepis transfuga* Spassky and Merkusheva 1967, *Parandrya feodorovi* Gulyaev and Chechulin 1996, *Paranoplocephala aquatica* Genov et al. 1996, *Paranoplocephala blanchardi* (Moniez 1891), *Paranoplocephala dentata* (Galli-Valerio 1905), *Paranoplocephala omphalodes* (Hermann 1783), *Paranoplocephala* sp., *Taenia crassiceps* larval (Zeder 1800), *Taenia hydatigena* larval Pallas 1766, *Taenia laticollis* larval Rudolphi 1819, *Taenia taeniaeformis* larval (Batsch 1786); NEMATODA - *Aspiculuris tetraptera* (Nitzsch 1821), *Boreostrongylus minutus* (Dujardin 1845), *Capillaria hepatica* (Bancroft 1893), *Capillaria wioletti* Rukhlyadeva 1950, *Capillaria* sp., *Eucoleus bacillatus* (Eberth 1863), *Eucoleus lemmi* (Retzius 1841), *Heligmosomum costellatum* (Dujardin 1845), *Heligmosomum glareoli* (Baylis 1928), *Heligmosomum polygyrum* (Dujardin 1845), *Longistriata minuta* (Dujardin 1845), *Longistriata wolgaensis* Schulz 1926, *Mastophorus muris* (Gmelin 1790), *Strongyloides papillosus* (Wedl 1856), *Syphacia arvicolae* Sharp

1973, *Syphacia obvelata* (Rudolphi 1802), *Trichinella* sp. larval, *Trichuris arvicolae* Feliu et al. 2000, *Trichuris muris* (Schrank 1788); TREMATODA - *Echinoparyphium sisjakowi* Skvortsov 1934, *Echinostoma miyagawai* Ishii 1932, *Echinostoma revolutum* Froelich 1802, *Gastrodiscoides hominis* (Lewis and McConal 1876), *Leucochloridium holostomum* (Rudolphi 1819), *Notocotylus noyeri* Joyeux 1922, *Opisthorchis felinus* (Rivolta 1884), *Plagiorchis arvicolae* Schulz and Skwarzow 1931, *Plagiorchis eutamias* Schulz 1932, *Psilotrema marki* Skvortsov 1934, *Psilotrema simillimum* (Mühling 1898), *Psilotrema spiculigerum* (Mühling 1898), *Quinqueserialis wolgensis* (Skvortsov 1934), *Strigea falconis* larval Szidat 1928, *Tetraserialis tscherbakovi* Petrov and Chertkova 1960.

Comments.—Some authors (see Musser and Carleton 2005 and discussion there-in) use *A. amphibius* for the Eurasian water vole due to recent synonymizing of the two species and its priority. However, as what was previously recognized as *A. amphibius* was restricted to the British Isles most of the relevant data pertaining to the continental forms will be listed under *A. terrestris*.

Biserkov et al. (1998) provides a redescription of *Heligmosomum glareoli*.

Chechulin (1988) reported that in the area of Novosibirsk, the intermediate hosts of *Notocotylus noyeri* were the snails *Anisus contortus*, *Segmentina nitida* and, *Planorbis planorbis*.

In several regions of Russia, water voles were found to commonly be final hosts for trematodes whose normal hosts were birds or other carnivorous mammals. Gubskii (1965) found *Strigea falconis*, normally in marsh birds, in water voles along the lower Dnestr River. Sulimov et al. (1983) found the bird trematodes *Leucochloridium holostomum* and *Echinostoma revolutum* in *Arvicola* at Lake Tenis near Omsk, Russia.

In the Don River basin, Lisitskaya (1958) found 52% and 5% of cats and water voles, respectively, infected with *Opisthorchis felinus*. Intermediate hosts in this region included the snail *Bithynia leachi* and cyprinid fish. In Kazakhstan, Smagulov et al. (1985) reported the intermediate of *O. felinus* as the

fish *Leuciscus idus*. Final hosts, besides *A. terrestris*, included foxes, mustelids, and wild boars; prevalence in domestic cats was 100%, in domestic dogs 11%, while human prevalence was up to 19% in some areas.

The diet of the water vole varies by area and season; although they usually feed on aquatic and riparian plants, they may also be highly carnivorous.

Literature.—Skvortsov 1934; Rukhlyadeva 1950; Lisitskaya 1958; Merkusheva 1958; Bernard 1959; Petrov and Chertkova 1960; Sadikhov 1960; Gubskii 1965; Chiriac and Hamar 1966; Horning 1968; Sharpilo 1973; Tokobaev 1976; Genov and Yanchev 1980; Fameree et al. 1981; Kovalchuk and Bonina 1981; Genov and Yanchev 1982; Deblock and Petavy 1983; Fatalijev 1983; Sulimov et al. 1983; Feliu et al. 1984; Smagulov et al. 1985; Artois and Le Pesteur 1986; Bonnin et al. 1986; Tenora et al. 1986; Chechulin 1988; Bonnin et al. 1989; Genov et al. 1996; Gottstein et al. 1996; Gulyaev and Chechulin 1996; Petavy et al. 1996; Biserkov et al. 1998; Chen et al. 2001; Tinnin et al. 2002; JunJie et al. 2003; Chechulin et al. 2005; Musser and Carleton 2005; Deter et al. 2007; Batsaikhan et al. 2010.

Clethrionomys (= *Myodes*) *rufocanus* (Sundevall 1846)

Gray Red-backed Vole

Distribution.—Members of *C. rufocanus* are found throughout northern Eurasia from Scandinavia to Kamchatka extending south as far as the Urals in the west and Mongolia in the east. In Mongolia these voles are found in the northern mountain regions of the Altai, Hovsgol region and Khentey and Khangay Mountains.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Andrya microti* Hansen 1947, *Anoplocephaloides dentatoides* Sato et al. 1993, *Anoplocephaloides* sp., *Aprostandrya* sp., *Catenotaenia* sp., *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis horrida* (Linstow 1901), *Meso-*

cestoides sp., *Paranoplocephala brevis* Kirschenblatt 1938, *Paranoplocephala kalelai* Tenora et al. 1985, *Paranoplocephala buryatiensis* Haukisalmi et al. 2007, *Paranoplocephala omphalodes* (Hermann 1783), *Relictolepis feodorovi* Gulyaev and Makarikov 2007, *Taenia taeniaeformis* larval (Batsch 1786), *Taenia mustelae* larval Gmelin 1790; NEMATODA - *Capillaria murissylvatici* (Diesling 1851), *Capillaria hepatica* (Bancroft 1893), *Capillaria* sp., *Glirovingylus rodentius* (Gubanov and Fedorov 1965), *Heligmosomum costellatum* (Dujardin 1845), *Heligmosomum petrovi* Krotov 1953, *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum yamagutii* Chabaud et al. 1963, *Heterakis spumosa* Schneider 1866, *Mammaniduloides hokkaidensis* Ohbayashi et al. 1968, *Mammolongistriata mammovitae* Dubinin 1953, *Mastophorus muris* (Gmelin 1790), *Rhabditis orbitalis* Sudhaus and Schulte 1986, *Rauschivingylus asiaticus* Domnich 1984, *Syphacia montana* Yamaguti 1943, *Syphacia obvelata* (Rudolphi 1802), *Syphacia stroma* (Linstow 1884), *Tenorastrongylus speciosus* (Konno 1958), *Trichinella* sp., *Trichuris* sp.; TREMATODA - *Brachylaima* sp., *Brachylecithum rodentini* Agapova 1955, *Corrigia vitta* (Dujardin 1845), *Quinqueserialis quinqueserialis* (Barker and Laughlin 1911), *Plagiorchis muris* Tanabe 1922.

Comments.—Although *Clethrionomys* has been in common usage for over 80 years as the genus-name for red-backed voles, *Myodes* has priority and is used by some researchers.

Literature.—Dubinin 1953; Krotov 1953; Agapova 1955; Machulsky 1958; Chabaud et al. 1963; Ohbayashi et al. 1968; Barus, Kullmann, and Tenora 1970; Surkov and Nadtochy 1971; Ishimoto 1974; Eltyshiev 1975; Fedorov 1976; Asakawa et al. 1983; Domnich 1984b; Hatakeyama 1986; Tenora et al. 1985a; Sudhaus and Schulte 1986; Tenora et al. 1986; Tenora et al. 1991; Asakawa et al. 1992; Tranbenkova 1992; Iwaki et al. 1993; Sato et al. 1993; Iwaki et al. 1996; Abe et al. 1997; Ganzorig et al. 1998; Asakawa 2001; Tinnin et al. 2002; Musser and Carleton 2005; Gulyaev and Makarikov 2007; Haukisalmi et al. 2007; Batsaikhan et al. 2010.

Clethrionomys* (=Myodes) *rutilus (Pallas 1779)

Northern Red-backed Vole

Distribution.—The northern red-backed vole is Holarctic in distribution, across Eurasia south into China and Korea in Asia, and as far south as central Canada in North America. In Mongolia they are found in the northern mountains similar in distribution to *C. rufocanus*.

Parasites.—In Mongolia: CESTODA - *Aprostandrya caucasia* Kirschenblatt 1938; NEMATA - *Rictularia amurensis* Schulz 1927, *Syphacia* sp. Across range: CESTODA - *Andrya arctica* Rausch 1952, *Catenotaenia cricetorum* Kirschenblatt 1949, *Catenotaenia henttoneni* Haukisalmi and Tenora 1993, *Catenotaenia pusilla* (Goeze 1782), *Catenotaenia* sp., *Dicranotaenia coronula* (Dujardin 1845), *Echinococcus multilocularis* larval Leuckart 1863, *Echinococcus sibiricensis* Rausch and Schiller 1954, *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis horrida* (Linstow 1901), *Mesocestoides kirbyi* Chandler 1944, *Nadejdolepis* sp., *Paranoplocephala longivaginata* Chechulin and Gulyaev 1998, *Rodentolepis straminea* (Goeze 1782), *Taenia martis* larval (Zeder 1803), *Taenia polyacantha* larval Leuckart 1856, *Taenia taeniaeformis* larval (Batsch 1786), *Taenia tenuicollis* larval Rudolphi 1809, *Taenia mustelae* Gmelin 1790; NEMATA - *Angiocaulus ryzikov* Yushkov 1971, *Capillaria murissylvatici* (Diesling 1851), *Glirovingylus rodentius* (Gubanov and Fedorov 1965), *Heligmosomum borealis* (Schulz 1930), *Heligmosomum cornucephale* Egorova and Nadtochy 1975, *Heligmosomum costellatum* (Dujardin 1845), *Heligmosomum mixtum* Schulz 1929, *Heligmosomum petrovi* Krotov 1953, *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum yamagutii* Chabaud et al. 1963, *Mammolongistriata mammovitae* Dubinin 1953, *Mastophorus muris* (Gmelin 1790), *Pterygodermatites* sp., *Rauschivingylus asiaticus* Domnich 1984, *Rhabditis orbitalis* larval Sudhaus and Schulte 1986, *Rictularia sibiricensis* Morozov 1959, *Syphacia petrusewicz* Bernard 1966, *Trichinella spiralis* larval (Owen 1835), *Trichinella* sp.; TREMATODA - *Alaria alata* larval (Goeze 1782), *Plagiorchis* sp..

Comments.—See taxonomic comments under *C. rufocanus*.

Surkov and Nadtochy (1971) found the waterfowl cestodes *Dicranotaenia coronula* and *Nadejdolepis* sp. in *C. rutilus* on Sakhalin Island.

Literature.—Rausch 1952; Dubinin 1953; Krotov 1953; Rausch and Schiller 1956; Rausch et al. 1956; Leikina et al. 1959; Rausch 1962; Machulsky 1958; Morozov 1959; Bernard 1966; Hasegawa 1970; Shults 1970; Surkov and Nadtochy 1971; Yushkov 1971; Egorova and Nadtochy 1975; Eltyshev 1975; Fedorov 1976; Wiger et al. 1976; Domnich 1984b; Bangs 1985; Sudhaus and Schulte 1986; Asakawa and Satoh 1987; Fedorov 1989; Tranbenkova 1992; Haukisalmi and Tenora 1993; Chechulin and Gulyaev 1998; Ganzorig et al. 1998; Ganzorig et al. 1998b; Asakawa 2001; Asakawa et al. 2001; Tinnin et al. 2002; Musser and Carleton 2005; Haukisalmi et al. 2007; Batsaikhan et al. 2010.

Ellobius tancrei Blasius 1884

Zaisan Mole Vole

Distribution.—This mole vole has a broad geographic distribution from northeastern Turkmenistan and Uzbekistan east through China and Mongolia. They are found throughout the desert and desert-steppe regions of the country.

Parasites.—In Mongolia: None currently known. Across range: *Capillaria hepatica* (Bancroft 1893).

Literature.—Asakawa et al. 2001; Tinnin et al. 2002.

Eolagurus luteus (Eversmann 1946)

Yellow Steppe Lemming

Distribution.—This species of lemming is narrowly distributed through eastern Kazakhstan, western Mongolia, and northwestern China. In Mongolia, they are found in the western Trans-Altai Gobi.

Parasites.—In Mongolia: None currently known. Across range: NEMATA - *Trichuris muris* (Schrunk 1788).

Literature.—Asakawa et al. 2001; Tinnin et al. 2002; Musser and Carleton 2005.

***Eolagurus przewalskii* (Büchner 1889)**

Przewalski's Steppe Lemming

Distribution.—Przewalski's lemming is found in northern China and Mongolia. They are found in the Great Lakes region east across the Gobi region of southern Mongolia.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005.

***Lagurus lagurus* (Pallas 1773)**

Steppe Vole

Distribution.—The steppe vole ranges from the Ukraine across Siberia, Kazakhstan, Mongolia and China. In Mongolia they are patchily distributed in the western Trans-Altai Gobi, north of the Gobi Altai and in the Great Lakes region.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Echinococcus multilocularis* larval Leuckart 1863, *Taenia polyacantha* Leuckart 1856; NEMATA - *Rhabditis orbitalis* larval Sudhaus and Schulte 1986, *Syphacia laguri* Pleshchev 1978, *Syphacia* sp.

Literature.—Pleshchev 1978a; Pleshchev 1978b; Sudhaus and Schulte 1986; Martynenko et al. 1988; Asakawa et al. 2001; Tinnin et al. 2002; Musser and Carleton 2005.

***Lasiopodomys brandti* (Radde 1861)**

Brandt's vole

Distribution.—Brandt's vole from Transbaikalia through northwest China. In Mongolia they are found across the steppe and mountain steppes through the center of the country.

Parasites.—In Mongolia: CESTODA - *Catenotaenia afghana* Tenora 1977, *Cladotaenia globifera* (Batsch 1786), *Mesocetoides* sp., *Taenia mustelae* Gmelin 1790, *Taenia polyacantha* Leuckart 1856; NEMATA - *Rictularia cristata* Froelich 1802, *Smirnova*

gregori Schulz and Andreeva 1950, *Syphacia nigeriana* Baylis 1928. Across range: CESTODA - *Echinococcus multilocularis* larval Leuckart 1863, *Echinococcus russicensis* larval ChongTi et al. 2007, *Echinococcus sibiricensis* larval Rausch and Schiller 1954, *Mesocetoides lineatus* (Goeze 1782), *Paranoplocephala brevis* Kirschenblatt 1938, *Paranoplocephala omphalodes* (Hermann 1783); NEMATA - *Syphacia obvelata* (Rudolphi 1802).

Comments.—This species forms large colonies, undergoes significant cyclic population expansions, serves as a primary food source for many steppe raptors, and is regarded as a significant pest species in many areas across its range.

Literature.—Schulz and Andreeva 1950; Machulskaya and Machulsky 1961; Meszaros 1974; Ganzorig, et al. 1998; Ganzorig, et al. 1999; Tang et al. 2004; Tinnin et al. 2002; ChongTi et al. 2007a; ChongTi et al. 2007b; Batsaikhan et al. 2010.

***Lasiopodomys mandarinus* (Milne-Edwards 1871)**

Mandarin Vole

Distribution.—The Mandarin vole is distributed from Transbaikalia and eastern Siberia south to central China and Korea. In Mongolia they are only reported from the northern Khangay Mountains and in the Orkhon and Selenge river valleys in the north.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Comments.—Min (1979) examined specimens from near Seoul, Korea, but all were uninfected.

Literature.—Min 1979; Tinnin et al. 2002; Musser and Carleton 2005.

***Microtus arvalis* (Pallas 1778)**

Common Vole

Distribution.—The common vole covers the western Palearctic in distribution, from Europe south to Iran and east to the region of Tuva then south into China. In Mongolia they are known only from the western Altai and Hovsgol Lake regions of the country.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811). Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Andrya bialowiezensis* Soltys 1949, *Andrya sp.*, *Aprostata andrya caucasia* (Kirschenblatt 1938), *Aprostata andrya macrocephala* (Douthitt 1915), *Catenotaenia cricetorum* Kirschenblatt 1949, *Catenotaenia pusilla* (Goeze 1782), *Cladotaenia sp.*, *Echinococcus granulosus* larval (Batsch 1786), *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis arvicolina* Cholodkovsky 1912, *Hymenolepis asymmetrica* Janicki 1904, *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis horrida* (Linstow 1901), *Mesocestoides leptothylacus* larval, *Mesocestoides lineatus* larval (Goeze 1782), *Paranoplocephala brevis* Kirschenblatt 1938, *Paranoplocephala dentata* (Galli-Valerio 1905), *Paranoplocephala janicki* Tenora et al. 1985, *Paranoplocephala onphalodes* (Hermann 1783), *Rodentolepis asymmetrica* (Janicki 1904), *Rodentolepis straminea* (Goeze 1782), *Taenia crassiceps* larval (Zeder 1800), *Taenia hydatigena* larval Pallas 1766, *Taenia mustelae* larval Gmelin 1790, *Taenia pisiformis* (Bloch 1780), *Taenia polyacantha* larval Leuckart 1856, *Taenia taeniaeformis* larval (Batsch 1786), *Taenia tenuicollis* larval Rudolphi 1819; NEMATODA - *Boreostrongylus minutus* (Dujardin 1845), *Capillaria hepatica* (Bancroft 1893), *Capillaria muris sylvatici* (Diesling 1851), *Eucoleus lemni* (Retzius 1841), *Heligmosomoides laevis* (Dujardin 1845), *Heligmosomum azerbaijani* Schachnasarova 1949, *Heligmosomum borealis* (Schulz 1930), *Heligmosomum costellatum* (Dujardin 1845), *Heligmosomum halli* (Schulz 1926), *Heligmosomum longispiculum* Tokobaev and Erkulov 1966, *Heligmosomum mixtum* Schulz 1929, *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum skrjabini* (Schulz 1926), *Heligmosomum sp.*, *Heligmosomum turgidum* (Walten 1923), *Mastophorus muris* (Gmelin 1790), *Rhabditis orbitalis* larval Sudhaus and Schulte 1986, *Syphacia microtus* Erkulov and Moldopiyazova 1975, *Syphacia montana* Yamaguti 1943, *Syphacia nigeriana* Baylis 1928, *Syphacia obvelata* (Rudolphi 1802), *Syphacia sp.*, *Thominx sadovskajae* Morozov 1959, *Trichinella spiralis* (Owen 1835), *Trichinella sp.*, *Trichuris muris* (Schränk 1788), *Trichuris arvicolae* Feliu et al. 2000; TREMATODA - *Alaria alata* larval (Goeze 1782), *Brachylaemus spimulosus* (Hoffmann 1899), *Notocotylus noyeri* Joyeux 1922, *Plagiorchis blatnensis* Chalup-

sky 1954, *Plagiorchis microti* Soltys 1949, *Tetraserialis tscherbakovi* Petrov and Chertkova 1960.

Comments.—*Microtus obscurus* (Eversmann 1841) is currently recognized as a subspecies of the more broadly distributed species *M. arvalis*. However, many authors have recognized it as a separate species, and information concerning the Mongolian form is sometimes reported under *M. obscurus*.

According to Feliu et al. (2000), reports of *Trichuris muris* in arvicolid species previous to their work likely represent *T. arvicolae*.

Literature.—Schachnasarova 1949; Soltys 1949; Spassky, Ryjchikov and Sudarikov 1952; Chalupsky 1954; Akhmyan 1956; Morozov 1959; Bernard 1960; Petrov and Chertkova 1960; Bernard 1961b; Lupu and Coroneanu 1962; Erhardova 1964; Chirac and Hamar 1966; Kurashvili 1967; Dorosz 1968; Prokopic 1970; Barus and Daniel 1972; Kisielewska et al. 1973; Merkusheva 1973; Murai and Tenora 1973; Sharpilo 1973; Baba 1974; Erkulov and Moldopiyazova 1975; Murai 1975; Tenora and Meszaros 1975; Sharpilo 1976; Tokobaev 1976; Meszaros 1977; Genov and Yanchev 1980; Loos-Frank 1980; Genov and Yanchev 1982; Delattre et al. 1985; Tenora et al. 1985b; Bonnin et al. 1986; Sudhaus and Schulte 1986; Brglez 1989; Barus and Hrab 1991; Gubanyi et al. 1992; Le Pesteur et al. 1992; Petavy et al. 1996; Feliu et al. 2000; Asakawa et al. 2001; Tinnin et al. 2002; Grikieniene 2005; Musser and Carleton 2005; Tinnin et al. 2008.

***Microtus fortis* Büchner 1889**
Reed Vole

Distribution.—The reed vole is found from Transbaikalia to the Amur region of Russia south through Korea and central China. They are known from the steppe and mountains of the extreme northeast of Mongolia.

Parasites.—In Mongolia: None currently known. Across range: TREMATODA - *Catantropis morosovi* Gubanov et al. 1966, *Plagiorchis eutamias* Schulz 1932, *Tetraserialis tscherbakovi* Petrov and Chertkova 1960.

Comments.—Dvoryadkin (1987) reported that the intermediate host of *Catatropis morosovi* in the Amur region of Russia is the snail *Bithynia contortrix*.

Literature.—Machulsky 1958; Eltyshev 1975; Dvoryadkin 1987; Dvoryadkin 1989; Tinnin et al. 2002; Musser and Carleton 2005.

***Microtus gregalis* (Pallas 1779)**
Narrow-headed Vole

Distribution.—The narrow-headed vole has a fragmented distribution in areas across Russia, through Central Asia to Mongolia and northern China. In Mongolia this species is known from the Mongolia Altai as well as the mountain and steppe region over much of the northern part of the country.

Parasites.—In Mongolia: CESTODA - *Aprostandrya caucasia* Kirschenblatt 1938; NEMATA - *Syphacia* sp. Across range: CESTODA - *Aprostandrya macrocephala* (Douthitt 1915), *Catenotaenia pusilla* (Goeze 1782), *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis diminuta* (Rudolphi 1819), *Mesocostoides lineatus* (Goeze 1782), *Paranoplocephala brevis* Kirschenblatt 1938, *Paranoplocephala dentata* (Galli-Valerio 1905), *Paranoplocephala omphalodes* (Hermann 1783), *Taenia polyacantha* larval Leuckart 1856; NEMATA - *Aspiculuris tetraptera* (Nitzsch 1821), *Capillaria hepatica* (Bancroft 1893), *Capillaria muris-sylvatici* (Diesling 1851), *Eucoleus lemni* (Retzius 1841), *Heligmosomum azerbaijani* Schachnasarova 1949, *Heligmosomum costellatum* (Dujardin 1845), *Heligmosomum longispiculum* Tokobaev and Erkulov 1966, *Heligmosomum polygyrum* (Dujardin 1845), *Mastophorus muris* (Gmelin 1790), *Rictularia cristata* Froelich 1802, *Rictularia sibiricensis* Morozov 1959, *Syphacia obvelata* (Rudolphi 1802), *Trichinella spiralis* (Owen 1835), *Trichuris muris* (Schränk 1788); TREMATODA - *Alaria alaria* (Goeze 1782), *Dicrocoelium lanceatum* Stiles and Hassall 1896.

Comments.—According to Feliu et al. (2000), reports of *Trichuris muris* in arviculids previous to their work likely represent *T. arvicolae*.

Literature.—Machulsky 1958; Nadtochy et al. 1966; Tokobaev 1976; Ganzorig et al. 1998b; Tinnin et al. 2002; Musser and Carleton 2005.

***Microtus limnophilus* Büchner 1889**
Lacustrine Vole

Distribution.—The lacustrine vole ranges from western Mongolia south through northern China. In Mongolia they range from the Mongolia Altai and Great Lakes region south across the Gobi Altai and Trans-Altai Gobi.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005.

***Microtus maximowiczii* (Schrenk 1859)**
Maximowicz's Vole

Distribution.—Maximowicz's vole ranges across from Lake Baikal to the Amur region of Russia, south into eastern Mongolia and northeast China. In Mongolia they are known from the eastern Khentey Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Parandrya feodorovi* Gulyaev and Chechulin 1996, *Paranoplocephala omphalodes* (Hermann 1783); TREMATODA - *Tetraserialis tscherbakovi* Petrov and Chertkova 1960, *Catatropis morosovi* Gubanov et al. 1966.

Comments.—Dvoryadkin (1987) reported that the intermediate host of *Catatropis morosovi* in the Amur region of Russia is snail *Bithynia contortrix*.

Literature.—Machulsky 1958; Dvoryadkin 1987; Dvoryadkin 1989; Gulyaev and Chechulin 1996; Tinnin et al. 2002; Musser and Carleton 2005.

***Microtus mongolicus* (Radde 1861)**
Mongolian Vole

Distribution.—The Mongolian vole is found in Transbaikalia, of course, Mongolia, and northeastern

China. This vole ranges across the Khentey and parts of the Khangay Mountains as well as the Hovsgol region of the country.

Parasites.—In Mongolia: CESTODA - *Taenia mustelae* (larval) Gmelin 1790. Across range: No other helminths from this species are known.

Literature.—Ganzorig et al. 1998; Tinnin et al. 2002; Musser and Carleton 2005.

***Microtus oeconomus* (Pallas 1776)**

Root Vole

Distribution.—The root vole is Holarctic in distribution. In the Old World, it ranges from Scandinavia south to the Baltic and east across Siberia, south into China as well as on Sakhalin and the Kurile Islands. In North America they range into north central Canada. In Mongolia, this species is found in the Mongolian Altai, Khentey and Khangay mountain ranges as well as the Hovsgol region.

Parasites.—In Mongolia: CESTODA - *Ctenotaenia citelli* (Kirschenblatt 1939). Across range: CESTODA - *Andrya microti* Hansen 1947, *Aprostotandrya macrocephala* (Douthitt 1915), *Cladotaenia circi* Yamaguti 1935, *Echinococcus granulosus* larval (Batsch 1786), *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis horrida* (Linstow 1901), *Paranoplocephala brevis* Kirschenblatt 1938, *Paranoplocephala dentata* (Galli-Valerio 1905), *Paranoplocephala infrequens* (Douthitt 1915), *Paranoplocephala omphalodes* (Hermann 1783), *Paranoplocephaloides schachmatovae* Gulyaev 1996, *Hymenolepis asymmetrica* Janicki 1904, *Taenia mustelae* larval Gmelin 1790, *Taenia polyacantha* Leuckart 1856, *Taenia twitchelli* larval Schwartz 1924; NEMATA - *Capillaria hepatica* (Bancroft 1893), *Capillaria muris-sylvatici* (Diesling 1851), *Heligmosomum costellatum* (Dujardin 1845), *Heligmosomum glareoli* (Baylis 1928), *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum ryjikovi* Nadtochy et al. 1971, *Heligmosomum schulzi* Nadtochy 1966, *Heligmosomum sp.*, *Mastophorus muris* (Gmelin 1790), *Rauschivingylus asiaticus* Domnich 1984, *Rictularia microti* McPherson and Tiner 1952, *Rhabditis orbitalis* larval Sudhaus and Schulte 1986, *Syngamus sp.*, *Sobolevingylus microti* Rausch and

Rausch 1969, *Syphacia nigeriana* Baylis 1928, *Toxascaris leonina* larval (Linstow 1902), *Trichinella spiralis* (Owen 1835), *Trichinella nativa* Britov and Boev 1972, *Trichuris muris* (Schrank 1788), *Trichostrongylus colubriformis* (Giles 1892); TREMATODA - *Dicrocoelium lanceatum* Stiles and Hassall 1896, *Notocotylus noyeri* Joyeux 1922, *Plagiorchis muris* Tanabe 1922, *Psilotrema simillimum* (Mühling 1898), *Quinqueserialis quinqueserialis* (Barker and Laughlin 1911).

Comments.—According to Feliu et al. (2000), reports of *Trichuris muris* in arvicolids previous to their work likely represent *T. arvicolae*. Biserkov et al. (1998) provides a redescription of *Heligmosomum glareoli*.

Kovalchuk (1981) conducted experimental work on *Trichinella* spp. in Siberia. He found that the local carnivores were infected with *T. nativa* and that rodents *M. oeconomus* and *Apodemus agrarius* could only be infected by *T. nativa* and not *T. spiralis*. Many of the records of infection by *T. spiralis* in rodents, at least in this region, may have to be reexamined.

Literature.—Rausch and Schiller 1951; McPherson and Tiner 1952; Rausch 1952; Erhardova 1955; Machulsky 1958; Leikina et al. 1959; Rausch 1962; Nadtochy 1966; Nadtochy et al. 1966; Rausch and Rausch 1969; Nadtochy et al. 1971; Murai 1975; Tenora and Meszaros 1975; Tokobaev 1976; Rausch 1977; Tenora et al. 1977; Pleshchev 1978b; Kovalchuk 1981; Kovalchuk and Bonina 1981; Domnich 1984b; Sudhaus and Schulte 1986; Tenora et al. 1986; Shakhmatova and Yudina 1989; Fujita et al. 1991; Matskasi et al. 1992; Sato and Kamiya 1992; Tranbenkova 1992; Haukisalmi et al. 1995; Gulyaev 1996; Asakawa et al. 2001; Tinnin et al. 2002; Grikieniene 2005; Musser and Carleton 2005; Ganzorig et al. 200

***Myopus schisticolor* (Lilljeborg 1844)**

Wood Lemming

Distribution.—The wood lemming is found from Scandinavia across to Kamchatka and south into the Altai Mountains, Mongolia and northeast China. In Mongolia they range across the northern mountain regions.

Parasites.—In Mongolia: None currently known. Across range: *Paranoplocephala dentata* (Galli-Valerio 1905), *Paranoplocephala gubanovi* Gulaev and Krivopalov 2003, *Paranoplocephala omphalodes* (Hermann 1783).

Literature.—Yushkov 1971; Tinnin et al. 2002; Gulyaev and Krivopalov 2003; Musser and Carleton 2005.

***Ondatra zibethicus* (Linnaeus 1786)**
Muskrat

Distribution.—This North American species has been introduced to the Palearctic and now is spread from Europe across Siberia and south into Mongolia, China, Korea as well as Japan. In Mongolia at one time they were known across the Khentey, Khangay, and Hovsgol regions of the country.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Macracanthorhynchus hirudinaceus* (Pallas 1781); CESTODA - *Aprostodrya macrocephala* (Douthitt 1915), *Echinococcus multilocularis* larval Leuckart 1863, *Paranoplocephala aquatica* Genov et al. 19996, *Taenia polyacantha* Leuckart 1856; NEMATODA - *Capillaria* sp., *Trichinella spiralis* larval (Owen 1835), *Trichuris suis* (Schränk 1788); TREMATODA - *Echinostoma miyagawii* Ishii 1932, *Opisthorchis felinus* (Rivolta 1884), *Plagiorchis arvicolae* Schulz and Skwarzow 1931, *Plagiorchis eutamias* Schulz 1932, *Plagiorchis proximus* Barker 1915, *Plagiorchis* sp., *Quinqueserialis quinqueserialis* (Barker and Laughlin 1911).

Comments.—As this is an introduced species in the country, only incidental records from the region have been included in the above list.

According to a re-examination of material by Genov et al. (1996), the specimens reported as *Paranoplocephala ondatrae* by Tenora and Murai (1980) and as *Aprostodrya macrocephala* by Spasskyi et al. (1951) belong to *P. aquatica*.

Literature.—Schulz 1932; Rausch et al. 1956; Leikina et al. 1959; Gvozdev 1969; Martynenko et al.

1988; Tranbenkova 1992; Genov et al. 1996; Tinnin et al. 2002; Maleika et al. 2003; Musser and Carleton 2005.

Cricetinae
***Allocricetulus curtatus* (Allen 1925)**
Mongolian Hamster

Distribution.—The Mongolian hamster is distributed across China and Mongolia. In Mongolia they are found in the Great Lakes region and east across the Gobi and Gobi Desert.

Parasites.—In Mongolia: *Moniliformis clarki* (Ward 1917), *Mesocostoides lineatus* (Goeze 1782). Across range: No other helminths from this species are currently known.

Literature.—Ganzorig et al. 1998; Tinnin et al. 2002; Musser and Carleton 2005; Tinnin et al. 2008.

***Cricetulus barabensis* (Pallas 1773)**
Striped Dwarf Hamster

Distribution.—The striped dwarf hamster ranges from southern Siberia across Mongolia into China and Korea. In Mongolia they are found across the northern half of the country as far south as the southern Khangay Mountains.

Parasites.—In Mongolia: CESTODA - *Catenotaenia asiatica* Tenora and Murai 1975; NEMATODA - *Syphacia nigeriana* Baylis 1928. Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Catenotaenia cricetorum* Kirschenblatt 1949, *Dicranotaenia* sp., *Taenia taeniaeformis* larval (Batsch 1786); NEMATODA - *Aspicularis tetraptera* (Nitzsch 1821), *Mastophorus muris* (Gmelin 1790), *Nippostrongylus rysavyi* (Erhardova 1959), *Orientostrongylus chinensis* Durette-Desset 1970, *Syphacia obvelata* (Rudolphi 1802), *Viannella chinensis* (Erhardova 1959); TREMATODA - *Plagiorchis eutamias* Schulz 1932.

Comments.—Durette-Desset (1970b) provided a redescription of *Nippostrongylus rysavyi*, which was inadequately described by Erhardova (1959).

Literature.—Machulsky 1958; Erhardova 1959; Durette-Desset 1970b; Durette-Desset 1970c; Meszaros 1974; Eltyshev 1975; Tenora and Murai 1975; Tinnin et al. 2002; Musser and Carleton 2005.

Cricetulus longicaudatus (Milne-Edwards 1867)
Long-tailed Dwarf Hamster

Distribution.—This species of hamster is ranges from Tuva south into the Altaïs and Kazakhstan, through Mongolia to central China. In Mongolia they are found across the western two-thirds of the country with the exception of the Hovsgol area and Trans-Altai Gobi.

Parasites.—In Mongolia: None currently known.
Across range: None currently known.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005.

Cricetulus migratorius (Pallas 1773)
Gray Hamster

Distribution.—The gray hamster is distributed from southern Europe south to Iran and Iraq east through Russia, Kazakhstan and Pakistan and into Mongolia and China. This species is found in the Trans-Altai Gobi, Gobi Desert, and eastern Gobi in southern Mongolia.

Parasites.—In Mongolia: CESTODA - *Taenia polyacantha* Leuckart 1856. Across range: CESTODA - *Aprostotandrya cricetuli* Lin et al. 1984, *Catenotaenia afghana* Tenora 1977, *Catenotaenia cricetorum* Kirschenblatt 1949, *Catenotaenia dendritica* (Goeze 1782), *Echinococcus multilocularis* larval Leuckart 1863, *Hymenolepis diminuta* (Rudolphi 1819), *Rodentolepis meriones* Tokobaev and Erkulov 1966, *Rodentolepis straminea* (Goeze 1782), *Taenia crassiceps* larval (Zeder 1800); NEMATA - *Ascaris lumbricoides* Linnaeus 1758, *Aspiculuris tetraptera* (Nitzsch 1821), *Capillaria gastrica* (Baylis 1926), *Gongylonema neoplasticum* (Fibiger and Ditlevsen 1914), *Physocephalus quadrialatus* Kirschenblatt 1949, *Streptopharagus kutassi* (Schultz 1927), *Syphacia mesocriceti* Quentin 1971, *Syphacia obvelata* (Rudolphi 1802), *Syphacia muris* (Yamaguti 1935), *Trichuris muris*

(Schrunk 1788), *Trichuris rhombomydis* (Schulz and Landa 1934); TREMATODA - *Brachylaemus spinulosus* (Hoffmann 1899), *Plagiorchis eutamias* Schulz 1932.

Literature.—Akhumyan 1956; Tenora and Kullmann 1970a; Erhardova and Daniel 1971; Quentin 1971; Sharpilo 1973; Eltyshev 1975; Sharpilo 1976; Tokobaev 1976; Meszaros 1977; Tenora 1977; Sahin 1979; Lin et al. 1984; Shakenov 1987; Ganzorig, et al. 1998; Ganzorig, et al. 1999; Asakawa et al. 2001; Tinnin et al. 2002; Musser and Carleton 2005.

Cricetulus sokolovi Orlov and Malygin 1988
Sokolov's Hamster

Distribution.—Sokolov's hamster is only found in southern Mongolia and Inner Mongolia, China. In Mongolia, they are currently known along a band extending between the Khangay Mountains and Gobi Altai east into the Gobi.

Parasites.—In Mongolia: None currently known.
Across range: None currently known.

Comments.—This currently recognized species is referred to as *C. barabensis obscurus* or *C. obscurus* in some earlier publications.

Literature.—Tinnin et al. 2002; Musser and Carleton 2005

Phodopus campbelli (Thomas 1905)
Campbell's Hamster

Distribution.—Campbell's hamster is found from western Mongolia across to Transbaikalia and south into northern China. This species is found in steppe and semi-desert regions across Mongolia.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis clarki* (Ward 1917); CESTODA - *Catenotaenia* sp.. Across range: *Syphacia obvelata* (Rudolphi 1802).

Literature.—Machulsky 1958; Ganzorig et al. 1999; Tinnin et al. 2002; Tinnin et al. 2008.

Phodopus roborovskii (Satunin 1903)

Roborovski's Hamster

Distribution.—Roborovski's hamster is found across Tuva, eastern Kazakhstan and Mongolia into central China. This hamster is found from the Great Lakes region east across the desert grasslands and desert regions of the south.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Literature.—Tinnin et al. 2002.

Muridae

Apodemus agrarius (Pallas 1771)

Striped Field Mouse

Distribution.—The striped field mouse is broadly distributed from Europe across Siberia and south through Mongolia, China and Korea. In Mongolia this species is restricted to the eastern border of the country in the Ikh Hyangan Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Cladotaenia globifera* (Batsch 1786), *Catenotaenia pusilla* (Goeze 1782), *Dilepis undula* (Schränk 1788), *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis fraterna* Stiles 1906, *Hymenolepis horrida* (Linstow 1901), *Railletina celebensis* (Janicki 1902), *Rodentolepis straminea* (Goeze 1782), *Taenia crassiceps* (Zeder 1800), *Taenia taeniaeformis* larval (Batsch 1786); NEMATA - *Angiostrongylus cantonensis* Chen 1935, *Aspiculuris tetraptera* (Nitzsch 1821), *Capillaria hepatica* (Bancroft 1893), *Heligmosomum aberrans* (Roe 1929), *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum borealis* (Schulz 1930), *Heligmosomum halli* (Schulz 1926), *Heligmosomoides neopolygyrus* Asakawa and Ohbayashi 1986, *Heligmosomoides* sp., *Heterakis spumosa* Schneider 1866, *Pelodera* sp., *Porrocaecum* sp., *Physaloptera mustelae* (Zhang and Yin 1980), *Physaloptera* sp., *Rictularia baicalensis* Spassky, Ryjchikov and Sudarikov 1952, *Rictularia cristata* Froelich 1802, *Rictularia strumica* Dimitrova et al. 1963, *Syngamus ryjikovi* Sadovskaya 1950, *Syphacia agraria* Sharpilo 1973, *Syphacia obvelata* (Rudolphi 1802), *Syphacia stroma* (Linstow 1884), *Toxocara apodemi* (Olsen

1957), *Trichinella spiralis* (Owen 1835), *Trichuris muris* (Schränk 1788); TREMATODA - *Alaria alata* (Goeze 1782), *Brachylaima* sp., *Neodiplostomum seoulense* (Seo, Rim, and Lee 1964), *Plagiorchis elegans* (Rudolphi 1802), *Plagiorchis muris* Tanabe 1922, *Plagiorchis stefanskii* Furmaga 1956, *Strigea falconis* Szidat 1928.

Literature.—Sadovskaya 1950; Spassky, Ryjchikov and Sudarikov 1952; Furmaga 1956; Furmaga 1957; Machulsky 1958; Zarnowski 1960; Lukashenko and Brzesky 1962; Rausch 1962; Dimitrova et al. 1963; Dorosz 1968; Yeh 1970; Sharpilo 1973; Meszaros et al. 1978; Genov and Yanchev 1980; Zhang and Yin 1980; Kovalchuk and Bonina 1981; Zhang 1985; Arnastauskene and Kazlauskas 1990; Asakawa et al. 1990; Hasegawa et al. 1993; Asakawa et al. 1994; ChunHung and KauHung 2000; Asakawa et al. 2001; Shimalov 2002; Tinnin et al. 2002; Hildebrand et al. 2004; Musser and Carleton 2005; Jong Yil et al. 2007a; Jong Yil et al. 2007b.

Apodemus peninsulae (Thomas 1907)

Korean Field Mouse

Distribution.—The Korean field mouse ranges through southern Siberia from the Altai Mountains to the Ussuri region and south into Mongolia, China and Korea, as well as the islands of Sakhalin and Hokkaido. In Mongolia, this species is found in the forests and forest-steppes of the northern part of the country, including the Mongolian Altai and Khentey and Khangay Mountains.

Parasites.—In Mongolia: None currently known. Across range: Acanthocephala - *Macracanthorhynchus catulinus* larval Kostylew 1927; CESTODA - *Catenotaenia pusilla* (Goeze 1782), *Hymenolepis diminuta* (Rudolphi 1819); NEMATA - *Capillaria hepatica* (Bancroft 1893), *Heligmosomoides neopolygyrus* Asakawa and Ohbayashi 1986, *Heligmosomum azerbaijani* Schachnasarova 1931, *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum skrjabini* Schulz 1926, *Mastophorus muris* (Gmelin 1790), *Rictularia baicalensis* Spassky, Ryjchikov, Sudarikov 1952, *Rictularia cristata* Froelich 1802, *Syphacia obvelata* (Rudolphi 1802).

Literature.—Machulsky 1958; Eltyshiev 1975; Asakawa and Ohbayashi 1986b; Iwaki et al. 1993; Asakawa et al. 2001; Tinnin et al. 2002.

***Meriones meridianus* (Pallas 1773)**

Mid-day Gerbil

Distribution.—The mid-day gerbil is distributed from the Don River in eastern Russia south to Iran and then east to Mongolia and China. In Mongolia, this species is found in the Great Lakes Depression, and south of the Khangay Mountains across the semi-desert and desert regions.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Taenia endotheracius* (Kirschenblatt 1948). Across range: CESTODA - *Catenotaenia pusilla* (Goeze 1782), *Catenotaenia rhombomydis* Schulz and Landa 1934, *Echinococcus multilocularis* larval Leuckart 1863, *Taenia krepkogorski* larval (Schulz and Landa 1935), *Mathevotaenia tivensis* Kadenatsii and Sulimov 1964, *Taenia taeniaeformis* larval (Batsch 1786), *Hymenolepis ogniewi* Skrjabin 1924, *Taenia polyacantha* larval Leuckart 1856; NEMATA - *Aspiculuris tetraptera* (Nitzsch 1821), *Dentostella translucida* Schulz and Krepkogorskaya 1932, *Dipetalonema viteae* (Krepkogorskaya 1933), *Gongylonema neoplasticum* (Fiber and Ditlevsen 1914), *Gongylonema problematicum* Schulz 1924, *Mastophorus muris* (Gmelin 1790), *Physaloptera massino* Schulz 1926, *Rictularia caucasia* Schulz 1927, *Streptopharagus kutassi* (Schultz 1927), *Trichuris muris* (Schränk 1788), *Trichuris rhombomydis* (Schulz and Landa 1934).

Literature.—Schulz and Krepkogorskaja 1932; Kadenatsii and Sulimov 1964; Kairov 1976; Tokobaev 1976; Ganzorig et al. 1998; Asakawa et al. 2001; Tinnin et al. 2002; Tinnin et al. 2008; Batsaikhan et al. 2010.

***Meriones tamariscinus* (Pallas 1773)**

Tamarisk Gerbil

Distribution.—This species of gerbil ranges from the Caucasus Mountains east through Kazakhstan to western Mongolia and China. In Mongolia, this species is restricted to the Trans-Altai Gobi.

Parasites.—In Mongolia: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811). Across range: CESTODA - *Mathevotaenia symmetrica* (Baylis 1927), *Rodentolepis meriones* Tokobaev and Erkulov 1966; NEMATA - *Aspiculuris asiatica* Schulz 1927, *Dermatopallarya baylisi* Skrjabin 1924, *Heligmosomum azerbaijani* Schachnasarova 1949, *Heligmosomum skrjabini* (Schulz 1926), *Rictularia bicalensis* Spassky, Ryjnikov, Sudarikov 1952, *Syphacia* sp., *Trichuris* sp.; TREMATODA - *Plagiorchis elegans* (Rudolphi 1802), *Dicrocoelium lanceatum* Stiles and Hassall 1896.

Comments.—This species, as opposed to its congeners which are found in more arid habitats, is primarily found around oases and salt marshes.

Literature.—Schulz 1927; Tokobaev 1976; Asakawa et al. 2001; Tinnin et al. 2002; Musser and Carleton 2005; Tinnin et al. 2008; Batsaikhan et al. 2010.

***Meriones unguiculatus* (Milne-Edwards 1867)**
Mongolian Gerbil

Distribution.—The Mongolian gerbil ranges from the Transbaikal region through Mongolia into northern China. This species is found primarily across the southern half of Mongolia in desert and semi-desert regions, but also penetrates north along river valleys into mountain and forest steppe habitats.

Parasites.—In Mongolia: CESTODA - *Linguatula serrata* larval Froelich 1789, *Mesocestoides* sp. larval, *Taenia endotheracius* larval (Kirschenblatt 1948). Across range: *Moniliformis moniliformis* (Bremser 1811), *Dipylidinae* gen. sp., *Echinococcus multilocularis* larval Leuckart 1863; NEMATA - *Gongylonema neoplasticum* (Fibiger and Ditlevsen 1914), *Mastophorus muris* (Gmelin 1790).

Comments.—This species is also known to occur commonly in and around towns. They may also use the abandoned burrows of *Lasiopodomys brandti* when available.

Literature.—Vuitton et al. 1998; Machulsky 1958; Tang et al. 1988; Ganzorig et al. 1998; Tinnin et al. 2002; Batsaikhan et al. 2010.

***Micromys minutus* (Pallas 1771)**

Harvest Mouse

Distribution.—The harvest mouse is found across the Palearctic realm. In Mongolia this species is restricted to the northern border of the country in the Mongolian Altai, Hovsgol, Khentey Mountains and eastern steppes.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Hymenolepis diminuta* (Rudolphi 1819), *Rodentolepis microstoma* (Dujardin 1845), *Rodentolepis fraterna* (Stiles 1906), *Taenia taeniaeformis* (Batsch 1786); NEMATA - *Strongyloides ratti* Sandground 1925, *Syphacia petrusewiczii* Bernard 1966, *Syphacia stroma* (Linstow 1884), *Syphacia vanderbruei* Bernard 1966, *Trichinella spiralis* (Owen 1835); TREMATODA - *Plagiorchis elegans* (Rudolphi 1802).

Literature.—Karpinski and Kaminska 1948; Schmidt 1962; Matskasi 1971; Sharpilo and Gritsai 1975; Tenora and Meszaros 1975; Meszaros et al. 1978; Genov and Yanchev 1980; Feliu and Mas-Coma 1986; Hasegawa 1986; Tenora et al 1991; Tinnin et al. 2002; Musser and Carleton 2005; Grikieniene 2005; Zalesny et al. 2006.

***Mus musculus* Linnaeus 1758**

House Mouse

Distribution.—The house mouse is found worldwide. This species is known from across Mongolia.

Parasites.—In Mongolia: *Mesocestoides lineatus* larval (Goeze 1782). Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Echinococcus multilocularis* larval Leuckart 1863, *Taenia taeniaeformis* larval (Batsch 1786), *Catenotaenia cricetorum* Kirschenblatt 1949, *Catenotaenia pusilla* (Goeze 1782), *Hymenolepis diminuta* (Rudolphi 1819), *Hymenolepis horrida* (Linstow 1901), *Rodentolepis straminea* (Goeze 1782), *Joyeuxiella rossicum* (Skrjabin 1923), *Mathevotaenia symmetrica* (Baylis 1927), *Mesocestoides lineatus* larval (Goeze 1782), *Taenia taeniaeformis* larval (Batsch 1786); NEMATA - *Aspiculuris kazakhstanica* Schulz 1927, *Aspiculuris schulzi* Poppov and Naz-

arova 1930, *Aspiculuris tetraptera* (Nitzsch 1821), *Ganguleterakis spumosa* (Schneider 1866), *Heligmosomum polygyrum* (Dujardin 1845), *Heligmosomum skrjabini* (Schulz 1926), *Mastophorus muris* (Gmelin 1790), *Orientostrongylus tenorai* Durette-Desset 1970, *Oxyntema boueti* (Gendre 1911), *Physaloptera massino* Schulz 1926, *Protospirura armeniana* Aloyan 1951, *Protospirura* sp., *Rictularia amurensis* Schulz 1927, *Rictularia baicalensis* Spassky, Ryjnikov, Sudarikov 1952, *Rictularia muris* Galli-Valerio 1932, *Syphacia obvelata* (Rudolphi 1802), *Syphaciuris rodenti* Erkulov and Moldopiyazova 1975, *Tenorastrongylus afghanus* (Tenora 1959), *Trichuris muris* (Schränk 1788); TREMATODA - *Brachylaemus recurvus* (Dujardin 1845).

Comments.—This is a partial list of the known parasites of *Mus musculus*, emphasizing those known from Central Asia. In addition to the expected association with human habitation, *Mus* also is widely found in oases and other dense riparian areas across the country.

Literature.—Galli-Valerio 1932; Morgan 1943; Schachnasarova 1949; Aloyan 1951; Spassky, Ryjnikov and Sudarikov 1952; Akhumyan 1956; Machulsky 1958; Skrjabin and Sobolev 1964; Chiriach and Hamar 1966; Kurashvili 1967; Barus, Kullmann, and Tenora 1970; Durette-Desset 1970d; Eltyshiev 1975; Erkulov and Moldopiyazova 1975; Tokobaev 1976; Genov and Yanchev 1980; Erkulov and Moldopiyazova 1986; Martynenko et al. 1988; Haukisalmi and Tenora 1993; Ganzorig et al 1998; Vuitton et al. 1998; Tinnin et al. 2002; Batsaikhan et al. 2010.

***Rattus norvegicus* (Berkenhout 1769)**

Norway Rat

Distribution.—The Norway rat has a world-wide distribution. In Mongolia they are found in the north-eastern part of the country.

Parasites.—In Mongolia: None currently known. Across range: ACANTHOCEPHALA - *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Taenia taeniaeformis* larval (Batsch 1786), *Catenotaenia pusilla* (Goeze 1782), *Hymenolepis diminuta* (Rudolphi 1819), *Mesocestoides lineatus* larval (Goeze 1782),

Rodentolepis straminea (Goeze 1782); NEMATA - *Aspiculuris tetraptera* (Nitzsch 1821), *Capillaria annulosa* (Dujardin 1845), *Capillaria hepatica* (Bancroft 1893), *Ganguleterakis spumosa* (Schneider 1866), *Mastophorus muris* (Gmelin 1790), *Strongyloides ratti* Sandground 1925, *Syphacia muris* (Yamaguti 1935), *Syphacia obvelata* (Rudolphi 1802), *Trichinella spiralis* (Owen 1835), *Trichosomoides crassicauda* (Bellingham 1840); TREMATODA - *Isthmiomorpha melis* (Schränk 1788), *Plagiorchis muris* Tanabe 1922.

Comments.—This is a partial list of the known parasites of the Norway rat, emphasizing those known from Central Asia. Like *Mus*, this species of *Rattus* is often found in dense riparian areas in Mongolia in addition to their association with humans.

Literature.—Spassky, Ryjhikov and Sudarikov 1952; Machulsky 1958; Lupu and Cironceanu 1962; Chirac and Hamar 1966; Kurashvili 1967; Matskasi 1971; Eltyshvili 1975; Meszaros 1977; Min 1979; Genov and Yanchev 1980; Iwaki et al. 1993; Tinnin et al. 2002; Musser and Carleton 2005; Batsaikhan et al. 2010.

Rhombomys opimus (Lichtenstein 1832)
Great Gerbil

Distribution.—The great gerbil is distributed from Iran east through Pakistan, Afghanistan, Kazakhstan, into Mongolia and China. In Mongolia this species found across the desert and desert-steppe regions of the south.

Parasites.—In Mongolia: CESTODA - *Taenia endothoracicus* (Kirschenblatt 1948). Across range: ACANTHOCEPHALA - *Moniliformis* sp.; CESTODA - *Catenotaenia pusilla* (Goeze 1782), *Catenotaenia rhombomydis* Schulz and Landa 1934, *Echinococcus multilocularis* larval Leuckart 1863, *Taenia krepkogorski* larval (Schulz and Landa 1935), *Hymenolepis horrida* (Linstow 1901), *Hymenolepis ognevi* Skrjabin 1924, *Multiceps endothoracicus* larval (Kirschenblatt 1948), *Taenia macrocystis* larval (Diesling 1850), *Taenia taeniaeformis* larval Batsch 1786), *Taenia polyacantha* larval Leuckart 1856; NEMATA - *Aspiculuris asiatica* Schulz 1927, *Aspiculuris tetraptera* (Nitzsch

1821), *Dentostomella translucida* Schulz and Krepkogorskaja 1932, *Dipetalonema viteae* (Krepkogorskaya 1933), *Gongylonema neoplasticum* (Fiber and Ditlevsen 1914), *Physaloptera massino* Schulz 1926, *Syphacia obvelata* (Rudolphi 1802), *Syphacia stroma* (Linstow 1884), *Trichuris rhombomydis* (Schulz and Landa 1934), *Trichuris spalacis* (Petrov and Potekhina 1953), *Trichuris* sp..

Comments.—This large, up to 250g, gerbil lives in large complex colony systems, which in some areas, such as Kazakhstan, are large enough to be viewed from satellite images. They are widely regarded as a pest species in some areas, and are known to be a prominent species involved in outbreaks of plague (*Yersinia pestis*).

Literature.—Schulz 1927; Schulz and Krepkogorskaja 1932; Krepkogorskaya 1933; Morgan 1943; Petrov and Potekhina 1953; Shleiker and Samsonova 1953; Buliginskaya et al. 1956; Chabaud 1956; Buliginskaya et al. 1959; Chun-Syun and Alekseev 1960; Davlatov 1967; Kairov 1976; Tokobaev 1976; Shakenov 1987; Ganzorig et al. 1998; Skrjabin and Sobolev 1964; Asakawa et al. 2001; Tinnin et al. 2002; Musser and Carleton 2005; Batsaikhan et al. 2010.

Spalacidae
Myospalax aspalax (Pallas 1776)
False Zokor

Distribution.—The false Zokor is found in the Amur region of Russia, Mongolia, and northeast China. In Mongolia they are found in central Mongolia, including the Khentey and Khangay Mountains.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Comments.—This fossorial species builds extensive tunnel systems, often of 100m in length, which is extensively used by other species such as *Spermophilus*.

Literature.—Tinnin et al. 2002; Batsaikhan et al. 2010.

Myospalax psilurus (Milne-Edwards 1874)
Manchurian Zokor

Distribution.—This species of zokor is known from the Amur region of Russia, Mongolia, and north-east and central China. In Mongolia the Manchurian zokor is only known from the eastern border in the Ikh Hyangan Mountains.

Parasites.—In Mongolia: NEMATA - *Ascarops strongylina* (Rudolphi 1819). Across Range: NEMATA - *Heligmosomum myospalaxi* Nadtochy 1970.

Literature.—Nadtochy 1970; Ganzorig et al. 1999; Elias et al. 2002; Tinnin et al. 2002; Musser and Carleton 2005.

Myoxidae
Dryomys nitedula (Pallas 1778)
Forest Dormouse

Distribution.—The dormouse is distributed from Europe and the Middle East across Asia. In Mongolia it has been reported from the Mongolian Altai and the Dzungarian Desert.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Mesocetoides lineatus* larval (Goeze 1782), *Paranoplocephala omphalodes* (Hermann 1783), *Rodentolepis merionis* Tokobaev and Erkulov 1966, *Rodentolepis microstoma* (Dujardin 1845), *Rodentolepis straminea* (Goeze 1782); NEMATA - *Rictularia amurensis* Schulz 1927, *Rictularia elvirae* Parona 1889; TREMATODA - *Brachylaemus spinulosus* (Hoffmann 1899), *Lecithodendrium dryomi* Matsaberidze and Khoteovski 1966, *Plagiorchis maculosus* (Rudolphi 1802), *Plagiorchis talassensis* Tokobaev and Erkulov 1966.

Literature.—Matsaberidze and Khoteovski 1966; Tokobaev and Erkulov 1966; Tenora 1967; Sharpilo 1976; Tokobaev 1976; Erkulov and Moldopiyazova 1986; Khudaibergenov 1986; Tinnin et al. 2002; Holden 2005.

LAGOMORPHA
Ochotonidae
Ochotona alpina (Pallas 1773)
Alpine Pika

Distribution.—The alpine pika is found from northwestern Afghanistan across southern Russia, northern Mongolia, and China. In Mongolia this species ranges across the Mongolian Altai and the Khentey and Khangay Mountains.

Parasites.—In Mongolia: CESTODA - *Schizorchis mongoliensis* Tinnin et al. 2008; *Catenotaenia* sp.; NEMATA - *Dermatoxys schumakovitschi* (Schulz 1948). Across range: CESTODA - *Schizorchis altaica* Gvozdev 1951, *Hydatigena* sp., *Paruterina candelabraria* (Goeze 1782), *Taenia hydatigena* larval Pallas 1766, *Taenia mustelae* larval Gmelin 1790, *Taenia tenuicollis* larval Rudolphi 1819; NEMATA - *Capillaria muris-sylvatici* (Diesling 1851), *Cephaluris andrejevi* Schulz 1948, *Citellinema orientale* Schulz 1933, *Eugenuris* sp., *Dermatoxys schumakovitschi* (Schulz 1948), *Graphidiella olsoni* Gvozdev 1966, *Heligmosomum dubini* Gvozdev 1966, *Labiostomum naimi* Akhtar 1941, *Labiostomum vesicularis* Gvozdev 1956, *Murielus harpispiculus* Dikmans 1939, *Obbayashinema dubini* (Gvozdev 1966), *Thominx sardovskajae* Morozov 1959.

Literature.—Schulz 1948; Gvozdev 1951; Spassky and Ryjnikov 1951; Spassky, Ryjnikov and Sudarikov 1952; Gvozdev 1956; Gvozdev 1962; Gvozdev 1966; Gvozdev et al. 1970; Savalev 1972; Fedorov and Potapkina 1975; Durette-Desset et al. 2000; Tinnin et al. 2002; Tinnin et al. 2008.

Ochotona dauurica (Pallas 1776)
Daurian Pika

Distribution.—The Daurian pika is found in the steppes from the Altai across Tuva and Transbaikalia south into Mongolia and China. In Mongolia they range through the Mongolian and Gobi Altai Mountains as well as steppe habitats in the northern part of the country.

Parasites.—In Mongolia: CESTODA - *Ctenotaenia citelli* (Kirschenblatt 1939), *Diuterinotaenia spasskyi* Gvozdev 1961, *Schizorchis altaica* Gvozdev 1951, *Taenia retracta* Linstow 1903; NEMATA - *Cephaluris andrejevi* Schulz 1948, *Dermatoxys schumakovitschi* (Schulz 1948), *Heligmosomum mongolicum* (Danzan 1976), *Lablostomum vesicularis* Gvozdev 1956. Across range: ACANTHOCEPHALA - *Moniliformis clarki* (Ward 1917), *Moniliformis moniliformis* (Bremser 1811); CESTODA - *Diuterinotaenia polyclada* Yun et al. 2000, *Diuterinotaenia spasskyi* Gvozdev 1961, *Echinococcus multilocularis* larval Leuckart 1863, *Hydatigena* sp. larval, *Mesocestoides lineatus* larval (Goeze 1782), *Schizorchis altaica* Gvozdev 1951; NEMATA - *Cephaluris andrejevi* Schulz 1948, *Graphidiella olsoni* Gvozdev 1966, *Heligmosomum polygyrum* (Dujardin 1845), *Murielus tjanschaniensis* Gvozdev 1962, *Ohbayashinema erbaevae* Durette-Desset et al. 2000, *Syphacia obvelata* (Rudolphi 1802), *Travassospirura* sp..

Comments.—This species is colonial as opposed to many of the northern species and may reach high densities during peak years.

Literature.—Schulz 1948; Machulsky 1958; Gvozdev et al. 1970; Meszaros 1974; Sulimov and Obukhov 1974; Danzan 1978; Ganzorig et al. 1996; Ganzorig et al. 1998b; Durette-Desset et al. 2000; Yun et al. 2000; Tinnin et al. 2002; Ganzorig et al. 2007; Tinnin et al. 2008; Batsaikhan et al. 2010.

Ochotona hoffmanni (Formozov et al. 1996)
Hoffmann's Pika

Distribution.—As is currently known, Hoffmann's pika is narrowly distributed across the mountains of northern Mongolia and Transbaikalia. In Mongolia they are found in the northern Khentey Mountains.

Parasites.—In Mongolia: None currently known. Across range: None currently known.

Comments.—This species has not been studied aside from the original descriptions and as such is not recognized by some authors.

Literature.—Tinnin et al. 2002.

Ochotona hyperborea (Pallas 1811)
Northern Pika

Distribution.—The northern pika is distributed from the Ural Mountains through Siberia to Sakhalin Island and Japan, and south to Mongolia China, and Korea. In Mongolia it is found in the Lake Hovsgol region and the Khentey and Khangay Mountains.

Parasites.—In Mongolia: CESTODA - *Schizorchis altaica* Gvozdev 1951. Across range: CESTODA - *Schizorchis ryzhikovi* Rausch 1984, *Schizorchis yamashiti* Rausch 1963; NEMATA - *Cephaluris andrejevi* Schulz 1948, *Dermatoxys schumakovitschi* (Schulz 1948), *Murielus harpescipulus* Dikmans 1939, *Ohbayashinema abei* Fukumoto et al. 1986.

Literature.—Machulsky 1958; Rausch 1963; Mustafaev 1968; Ganzorig et al. 1998b; Durette-Desset et al. 2000; Tinnin et al. 2002; Tinnin et al. 2008.

Ochotona pallasii (Gray 1867)
Pallas' Pika

Distribution.—Pallas' pika has a disjunct distribution in areas of arid mountains and high elevation steppe in Kazakhstan, the Altai Mountains, Tuva, Mongolia, and northern China. In Mongolia they are restricted to the southern Khangay Mountains and the Mongolian and Gobi Altai.

Parasites.—In Mongolia: CESTODA - *Schizorchis ryzhikovi* Rausch 1984. Across range: ACANTHOCEPHALA - *Moniliformis clarki* (Ward 1917); CESTODA - *Diuterinotaenia spasskyi* Gvozdev 1961, *Echinococcus multilocularis* larval Leuckart 1863, *Schizorchis altaica* Gvozdev 1951; NEMATA - *Capillaria murissylvatici* (Diesling 1851), *Cephaluris andrejevi* Schulz 1948, *Dermatoxys schumakovitschi* (Schulz 1948), *Graphidiella olsoni* Gvozdev 1966, *Lablostomum vesicularis* Gvozdev 1956, *Murielus tjanschaniensis* Gvozdev 1962, *Nematodirus aspinosus* Schulz 1931, *Trichuris* sp., *Trichostrongylus probolurus* (Railliet 1896).

Comments.—Similarly to *O. dauurica*, Pallas' pika forms extensive colonies and reaches immense population densities during peak years. It is widely viewed as a pest species, which competes with livestock for fodder.

Literature.—Gvozdev et al. 1970; Sulimov et al. 1974; Ganzorig 1998; Tinnin et al. 2002; Tinnin et al. 2008; Batsaikhan et al. 2010.

Leporidae
Lepus tibetanus Waterhouse 1841
Desert Hare

Distribution.—The desert hare ranges from Afghanistan east through Pakistan, north into the Altai Mountains, and across southern Mongolia and northern China. In Mongolia this species is found from the Mongolian and Gobi Altai south through the western part of the country.

Parasites.—In Mongolia: NEMATODA - *Dermatoxys veligera* (Rudolphi 1819), *Micipsella numidica* (Seurat 1917), *Nematodirus petrovi* Ivashkin 1954. Across range: No other helminths are currently known from this species.

Comments.—This species has often been considered synonymous with *L. tolai*, which inhabits the middle to northern reaches of the country. As such, many sources include this species under *L. tolai* for southern Mongolia. Some of the records attributed to *L. tolai* across its range outside of Mongolia may in fact represent infection by this host species.

Literature.—Ivashkin 1954; Hoffmann and Smith 2005; Batsaikhan et al. 2010.

Lepus timidus Linnaeus 1758
Mountain Hare

Distribution.—The mountain hare is widely distributed across Eurasia. This hare is widely distributed across northern Mongolia; in the Khentey, Khangay, and Khingan Mountains as well as the Lake Hovsgol region.

Parasites.—In Mongolia: NEMATODA - *Trichuris leporis* (Froelich 1789). Across range: CESTODA - *Andrya cuniculi* (Blanchard 1891), *Ctenotaenia denticulata* (Rudolphi 1804), *Echinococcus granulosus* larval (Batsch 1786), *Mosgovoyia pectinata* (Goeze 1782), *Multiceps serialis* larval (Gervais 1847), *Paranoplocephala omphalodes* incidental (Hermann 1783), *Taenia macrocystis* larval (Diesling 1850), *Taenia pisiformis* larval (Bloch 1780); NEMATODA - *Dirofilaria timidi* Gubanov & Fedorov 1966, *Graphidium strigosum* (Dujardin 1845), *Heligmonella leporis* (Schulz 1931), *Nematodirus aspinosus* Schulz 1931, *Obeliscoides leporis* Schulz 1931, *Passalurus ambiguus* (Rudolphi 1819), *Protostrongylus kamenskii* Schulz 1930, *Protostrongylus pulmonalis* (Froelich 1802), *Protostrongylus terminalis* (Passerini 1884), *Subulura citelli* Sulimov 1961, *Trichostrongylus colubriformis* (Giles 1892), *Trichostrongylus retortaeformis* (Zeder 1809), *Trichostrongylus triramosus* Schulz 1931, *Trichuris leporis* (Froelich 1789), *Trichuris sylvilagi* Tiner 1950; TREMATODA - *Dicrocoelium dendriticum* (Rudolphi 1819), *Dicrocoelium lanceatum* Stiles and Hassall 1896, *Dicrocoelium orientalis* Sudarikov and Ryjnikov 1951, *Fasciola hepatica* Linnaeus 1758, *Plagiorchis vespertilionis* (Müller 1780).

Literature.—Spassky, Ryjnikov and Sudarikov 1952; Ivashkin 1954; Gubanov and Fedorov 1956; Machulsky 1958; Kontrimavichus and Popov 1960; Gubanov and Fedorov 1966; Gvozdev et al. 1970; Meszaros 1974; Eltyshv 1975; Durette-Desset 1978; Soveri and Valtonen 1983; Burzyantsev 1981; Belkin et al. 1982; Fukumoto et al. 1986; Tinnin et al. 2002.

Lepus tolai Pallas 1778
Tolai Hare

Distribution.—The tolai ranges from the Caspian Sea, south to Iran, east across Afghanistan and Kazakhstan, as well as into southern Siberia, Mongolia and China. In Mongolia this species is found across most of the country north and east of the Mongolian and Gobi Altai Mountains.

Parasites.—In Mongolia: None currently known. Across range: CESTODA - *Andrya cuniculi* (Blanchard 1891), *Andrya rhopalcephala* (Riehm

1891), *Echinococcus granulosus* larval (Batsch 1786), *Gvosdevilepsis fragmentata* (Gvozdev 1948), *Mesocestoides lineatus* larval (Goeze 1782), *Mesocestoides* sp., *Mosgovoyia pectinata* (Goeze 1782), *Multiceps serialis* larval (Gervais 1847), *Taenia pisiformis* larval (Bloch 1780); NEMATODA - *Dermatophys veligera* (Rudolphi 1819), *Micipsella numidica* (Seurat 1917), *Nematodirus aspinosus* Schulz 1931, *Nematodirus petrovi* Ivashkin 1954, *Passalurus ambiguus* (Rudolphi 1819), *Protostrongylus kamenskyi* Schulz 1930, *Protostrongylus terminalis* (Passerini 1884), *Trichuris leporis* (Froelich

1789), *Trichostrongylus retortaeformis* (Zeder 1809); TREMATODA - *Dicrocoelium lanceatum* Stiles and Hassall 1896, *Fasciola hepatica* Linnaeus 1758.

Comments.—See comments under *Lepus tibetanus*.

Literature.—Machulsky 1958; Gvozdev et al. 1970; Tokobaev 1976; Tinnin et al. 2002; Hoffmann and Smith 2005.

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